Vol. 1074 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

January 20, 1987

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed as of Nov. 1, 1986 and was announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

International PCT fees were changed due to differences in the exchange rate effective Nov. 1, 1986 and were announced in the *Official Gazette* at 1071 O.G. 22 on Oct. 21, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed:	250.00
European Patent Office as Searching Authority	
All cases:	1015.00
International fees	
Basic fee (first 30 pages):	430.00
Basic Supplemental fee (for each page over 30):	8.00
Designation fee for the first 10 national or regional offices:	105.00
Designation fee for 11th and subsequent designations:	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 17, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,425,667 through 4,426,738
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 2, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,356,573	06/219,858	11/2/82
4,356,576	06/265,587	11/2/82
4,356,582	06/264,285	11/2/82
4,356,586	06/253,774	11/2/82
4,356,593	06/308,986	11/2/82
4,356,617	06/244,505	11/2/82
4,356,630	06/261,253	11/2/82
4,356,633	06/286,774	11/2/82
4,356,635	06/219,989	11/2/82
4,356,650	06/278,059	11/2/82
4,356,652	06/269,535	11/2/82
4,356,658	06/233,551	11/2/82
4,356,659	06/255,229	11/2/82
4,356,661	06/221,970	11/2/82
4,356,665	06/264,077	11/2/82
4,356,669	06/314,308	11/2/82
4,356,699	06/226,827	11/2/82
4,356,709	06/239,390	11/2/82
4,356,720	06/231,206	11/2/82
4,356,721	06/218,235	11/2/82
4,356,788	06/258,128	11/2/82
4,356,791	06/255,262	11/2/82
4,356,809	06/269,118	11/2/82
4,356,810	06/234,660	11/2/82
4,356,812	06/340,998	11/2/82
4,356,839	06/301,461	11/2/82
4,356,843	06/338,911	11/2/82
4,356,855	06/282,944	11/2/82
4,356,883	06/303,758	11/2/82
4,356,885	06/294,441	11/2/82
4,356,908	06/242,872	11/2/82
4,356,915	06/310,298	11/2/82
4,356,927	06/302,195	11/2/82
4,356,928	06/275,719	11/2/82
4,356,929	06/226,789	11/2/82
4,356,932	06/275,701	11/2/82
4,356,934	06/243,617	11/2/82
4,356,943	06/325,022	11/2/82
4,356,944	06/241,262	11/2/82
4,356,951	06/268,711	11/2/82
4,356,977	06/235,451	11/2/82
4,356,987	06/257,926	11/2/82
4,356,995	06/291,082	11/2/82
4,357,002	06/292,406	11/2/82
4,357,043	06/217,696	11/2/82
4,357,076	06/217,420	11/2/82
4,357,082	06/220,525	11/2/82
4,357,086	06/287,792	11/2/82
4,357,095	06/228,374	11/2/82
4,357,096	06/241,302	11/2/82
4,357,118	06/239,617	11/2/82
4,357,122	06/217,247	11/2/82
4,357,170	06/288,650	11/2/82
4,357,171	06/232,998	11/2/82
4,357,175	06/281,455	11/2/82
4,357,176	06/236,982	11/2/82
4,357,177	06/254,946	11/2/82
4,357,180	06/228,425	11/2/82
4,357,185	06/265,300	11/2/82
4,357,192	06/232,447	11/2/82
4,357,198	06/293,071	11/2/82
4,357,205	06/298,596	11/2/82
4,357,226	06/215,938	11/2/82
4,357,231	06/267,200	11/2/82
4,357,269	06/241,521	11/2/82
4,357,278	06/252,841	11/2/82
4,357,294	06/229,874	11/2/82
4,357,296	06/228,276	11/2/82
4,357,309	06/240,158	11/2/82
4,357,347	06/326,895	11/2/82
4,357,365	06/247,902	11/2/82
4,357,428	06/333,898	11/2/82
4,357,429	06/359,917	11/2/82
4,357,439	06/295,045	11/2/82
4,357,457	06/339,123	11/2/82
4,357,474	06/242,081	11/2/82
4,357,480	06/242,488	11/2/82
4,357,495	06/232,913	11/2/82
4,357,503	06/219,378	11/2/82
4,357,504	06/219,880	11/2/82
4,357,506	06/248,431	11/2/82
4,357,518	06/293,416	11/2/82
4,357,539	06/225,329	11/2/82
4,357,547	06/237,322	11/2/82
4,357,551	06/244,096	11/2/82
4,357,615	06/233,078	11/2/82
4,357,623	06/257,167	11/2/82
4,357,624	06/246,014	11/2/82
4,357,642	06/278,097	11/2/82
4,357,645	06/263,153	11/2/82
4,357,688	06/300,875	11/2/82
4,357,694	06/274,802	11/2/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,846,254, Re. S.N. 854,063, Filed Apr. 17, 1986, Cl. 203/11, INTERFACE ENHANCEMENT APPLIED TO EVAPORATION OF LIQUIDS, Hugo H. Sephton, Owner of Record: *Inventor,* Attorney or Agent: M. Henry Heines, Ex. Gp.: 113

4,259,676, Re. S.N. 933,751, Filed Nov. 21, 1986, Cl. 346/76PH, THERMAL PRINT HEAD, Peter C. Salmon, et al., Owner of Record: *Santek, Inc., Los Altos, Calif.,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 216

4,487,468, Re. S.N. 933,009, Filed Nov. 20, 1986, Cl. 339/75MP, CARD EDGE CONNECTOR LOCKING DEVICE, James L. Fedder, et al., Owner of Record: *AMP, Inc., Harrisburg, Pa.,* Attorney or Agent: Jay L. Seitchik, et al., Ex. Gp.: 322

4,523,585, Re. S.N. 828,453, Filed Feb. 11, 1986, Cl. 128/80C, ANATOMIC BRACE FRACTURE FOR THE KNEE, Steve R. Lamb, et al., Owner of Record: *Orthopedic Systems, Inc., Hayward, Calif.,* Attorney or Agent: Theodore J. Bielen, Jr., et al., Ex. Gp.: 336

4,583,797, Re. S.N. 933,560, Filed Nov. 18, 1986, Cl. 339/6R, ROTATABLE ELECTRICAL CONNECTOR FOR COILED TELEPHONE CORD, Anthony R. Engelmore, et al., Owner of Record: *Inventor,* Attorney or Agent: Joseph W. Berenato, III, et al., Ex. Gp.: 322

4,607,069, Re. S.N. 934,459, Filed Nov. 24, 1986, Cl. 523/400, CURABLE COMPOSITIONS BASED ON EPOXY RESINS, Helmut Tesch, et al., Owner of Record: *BASF Aktiengesellschaft, Ludwigshafen, Federal Republic of Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 155

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Travelcare, Inc., assignee of Senior Vacations, Unlimited, Inc., Aurora, Ohio, Reg. Nos. 916,914, and 1,209,034 for the marks "TRAVEL CARE AND DESIGN", and "TRAVEL CARE", respectively, Canc. No. 15,434.

Yankee Doodle House, Inc., assignee, by mesne assignment, of Yankee Doodle House, Inc., Elmhurst, Ill., Reg. No. 868,272, for the mark "YANKEE DOODLE DANDY AND DESIGN", Canc. No. 15,682.

Yankee Doodle House, Inc., assignee, by mesne assignment, of Yankee Doodle House, Inc., Elmhurst, Ill., Reg. No. 981,345, for the mark "YANKEE DOODLE DANDY AND DESIGN", Canc. No. 15,683.

Apco Oil Corp., assignee of Anderson-Prichard Oil Corp., Oklahoma City, Okla., Reg. No. 528,276, for the mark "INKOL", Canc. No. 15,777.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Department of Commerce
Patent and Trademark Office
Disposition of British Abridgements
1855–1972

The U.S. Patent and Trademark Office (PTO) is offering to any interested party one set of classified British Abridgements, 1855–1972. These documents are stored at a warehouse in the Springfield, Va. area. There are five skids of documents with approximately 20 boxes per skid. The Manager of the PTO Scientific Library must be contacted within two weeks of publication of this notice. This set is being offered on a first come, first served basis. After verification by the Manager of this transaction, the interested party must arrange for the removal of these documents from storage at his/her own expense within 30 days. Inquiries should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Manager, Scientific Library [(703)–557–2955].

DONALD J. QUIGG,
Dec. 19, 1986. *Assistant Secretary and*
Commissioner of Patents
and Trademarks.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on Nov. 18, 1986 from the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names begin with A through D. Enclosed with the letter is a data sheet which must be completed and returned to OED as soon as possible. All data sheets returned to OED will be acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with A through D and you have not received a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Patricia M. Jordan at (703) 557–1728.

CAMERON WEIFFENBACH,
Dec. 2, 1986. *Director, Office of*
Enrollment and Discipline.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 20, 1987

Re. 31,450	4,577,777	4,598,836	4,610,759
Re. 32,263	4,578,458	4,598,881	4,611,789
D. 285,808	4,580,219	4,599,064	4,611,996
4,072,759	4,585,304	4,599,088	4,612,901
4,427,556	4,586,608	4,599,260	4,613,324
4,427,894	4,586,844	4,601,764	4,613,365
4,449,534	4,586,880	4,602,941	4,613,501
4,488,201	4,587,996	4,603,231	4,614,407
4,491,797	4,588,719	4,603,664	4,614,595
4,499,102	4,589,034	4,603,817	4,614,854
4,508,980	4,589,053	4,604,248	4,614,935
4,530,891	4,589,399	4,604,287	4,615,067
4,534,970	4,591,107	4,604,737	4,615,300
4,535,180	4,592,054	4,605,244	4,615,403
4,543,761	4,592,072	4,605,790	4,615,979
4,545,718	4,592,753	4,606,603	4,617,074
4,548,886	4,593,992	4,606,879	4,617,327
4,551,580	4,594,000	4,606,982	4,617,719
4,554,231	4,594,130	4,607,333	4,618,290
4,564,444	4,595,151	4,607,606	4,618,822
4,566,930	4,595,394	4,607,637	4,618,944
4,569,035	4,596,858	4,607,667	4,619,328
4,572,316	4,597,085	4,607,975	4,620,472
4,572,659	4,597,195	4,608,705	4,620,515
4,572,912	4,597,806	4,609,242	
4,572,920	4,598,708	4,610,690	
4,573,061	4,598,748	4,610,727	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 6, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-15-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-29-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-15-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-25-85
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-19-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-26-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	7-03-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-22-84
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	11-06-84
DESIGN, GROUP 290—K. L. CAGE, Director	6-13-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-29-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	4-08-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	7-09-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	6-03-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during December 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,480,966 to 3,487,469, inclusive

Plant Patents . . . . . Numbers 2,945 to 2,958 inclusive

REEXAMINATIONS

JANUARY 20, 1987

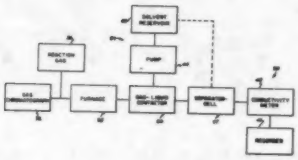
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,032,296 (621st)

ELECTROLYTIC CONDUCTIVITY DETECTOR SYSTEM

Randall C. Hall, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Reexamination Request No. 90/000,828, Jul. 30, 1985.
Reexamination Certificate for Patent No. 4,032,296, issued Jun. 28, 1977, Ser. No. 648,517, Jan. 12, 1976.
Division of Ser. No. 425,116, Dec. 17, 1973, Pat. No. 3,934,193.
Int. Cl.[4] G01N *27/08, 30/64, 31/12*
U.S. Cl. 422—89



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 8–10 are cancelled.

Claims 1 and 11 are determined to be patentable as amended.

Claims 2–7, dependent on an amended claim, are determined to be patentable.

New claims **12–21** are added and determined to be patentable.

1. An electrolytic conductivity detector for gas chromatography, said detector comprising:

compound supply means for providing as an output therefrom compounds to be tested in the form of eluant gases;

forming means for receiving said eluant gases from said compound supply means and forming therefrom conductivity supporting inorganic gaseous molecules;

solvent supply means for supplying an aqueous or organic solvent;

contactor means for mixing substantially immediately upon contact gaseous molecules received from said forming means with said solvent from said solvent supply means to form a mixture thereof;

separator means for receiving said mixture from said contactor means and substantially immediately separating said mixture into liquid and gas phases; and

measuring means for receiving said liquid phase from said separator means and measuring the conductivity of said liquid phase[.];

said separator means including an axial bore adapted to permit the liquid phase to flow along its wall with the gas phase flowing as a core; and

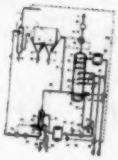
said measuring means being located along the bore so as to measure the liquid phase conductivity as the gas phase continues to flow through the bore.

B1 4,039,304 (622nd)

METHOD OF REMOVING SO_2 AND/OR OTHER ACID COMPONENTS FROM WASTE GASES

Horst Bechthold, Erftstadt-Friesheim, and Paul Bottger, Bensberg-Refrath, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Fed. Rep. of Germany

Reexamination Request No. 90/000,893, Nov. 1, 1985.
Reexamination Certificate for Patent No. 4,039,304, issued Aug. 2, 1977, Ser. No. 591,624, Jun. 30, 1975.
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1974, 2431130; Apr. 25, 1975, 2518386
Int. Cl.[4] B01D *53/14;* **B03C** *1/00;* **C01B** *17/00*
U.S. Cl. 55—10



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1—3, 10 and 11 were previously disclaimed.

Claims 4–9 and 12–14 are cancelled.

[1. A continuous process for removing pollutants from waste gases which pollutants are present in the gas in the form of acid components, the said process comprising

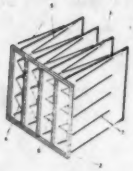
1. introducing the waste gas into an evaporator tower where the gas is mixed with an aqueous solution of a salt of said acid component;
2. heat-vaporizing the resulting mixture in said evaporator so as to form salt crystals from said salt solution and withdrawing said salt crystals from the gas substantially without said pollutants and solids from the gas;
3. passing the gas through a separation device to remove the formed crystals together with solids, initially present in the gas prior to passing the gas to an absorption tower;
4. then passing the now substantially dry gas including residual salt crystal to said absorption tower, introducing an alkaline absorbent into the tower, the absorbent being a liquid or forming a liquid in the tower and being adapted to form salts with said acid component of the gas in the form of an aqueous concentrated solution of the salt and to dissolve residual salt crystals present in said gas and introducing fresh water to the extent necessary to form and maintain the liquid absorbent and aqueous salt solution;
5. continuously circulating the formed salt solution out of and into the absorption tower;
6. while continuously withdrawing a controlled amount of said salt solution and recycling said amount into the evaporator tower for said gas-solids separation step and
7. discharging the pollutant-free gas from the absorption tower.]

B1 4,056,375 (623rd)

GAS FILTER ELEMENT

Wolfgang Ringel, Morlenbach; Peter Rutsch, Abtsteinach; Rolf Schneider, Weinheim, and Edgar Kohl, Abtsteinach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Reexamination Request No. 90/001,035, Jun. 19, 1986.
Reexamination Certificate for Patent No. 4,056,375, issued Nov. 1, 1977, Ser. No. 720,327, Sep. 3, 1976.
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541331
Int. Cl.[4] B01D *46/02, 29/10*
U.S. Cl. 55—381



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–9 is confirmed.

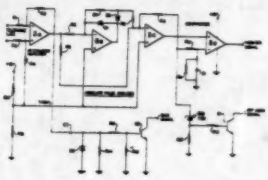
1. A gas filter element comprising a holding frame and at least one self-supporting wedge-shaped filter pocket each having its wide end open and secured to said frame, each filter pocket comprising a pair of substantially symmetrical pocket halves formed of fusible fibers and welded to one another along the wedge edge and centrally along the opposite wedge end faces and at least one laminar spacing element disposed within the pocket and extending from adjacent the open end toward the wedge edge, the spacing element being welded to the opposite inclined wedge faces, the filter pocket being rendered self-supporting by the welding of the pocket halves to one another and the welding of the spacing element to the pocket.

B1 4,451,707 (624th)

RING DETECTOR AND TELEPHONE LINE MONITORING SYSTEM FOR TELEPHONE ANSWERING INSTRUMENT

Bradford E. Hanscom, Downey, Calif., assignor to Fortel Corp., Compton, Calif.

Reexamination Request No. 90/000,954, Feb. 7, 1986.
Reexamination Certificate for Patent No. 4,451,707, issued May 29, 1984, Ser. No. 517,005, Jul. 25, 1983.
Continuation-in-part of Ser. No. 381,185, May 24, 1982, abandoned.
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—84 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

Claim 9 is cancelled.

Claim 8 is determined to be patentable as amended.

Claims 10–12, dependent on an amended claim, are determined to be patentable.

8. A monitoring system for controlling the operation of a telephone answering system, said monitoring system responding to direct current voltage differentials on the telephone line independent of the actual direct current voltage level of the telephone line, said monitoring system including in combination: input circuitry connected to the telephone line, *said input circuitry including circuit means for producing an output voltage representative of the actual direct current voltage level of the telephone line,* and output circuitry connected to said input circuitry [and], *said output circuitry including a comparator having a first input terminal connected to the output of said input circuitry and having a second input terminal, and self-biasing circuitry connected to the second input terminal of said comparator to bias said second input terminal to a voltage representing a predetermined percentage of the voltage applied to said first input terminal, said system being* responsive to said direct current voltage differentials on said telephone line occurring after the telephone answering system has been activated by a ring signal received over the telephone line to produce an output signal when said *direct current* voltage differentials exceed a predetermined minimum value so as to cause the telephone answering system to return to [its original] *the* condition *it was in* before the receipt of the ring signal.

REISSUES

JANUARY 20, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,332
CLUSTER TYPE TAG PIN ASSEMBLY

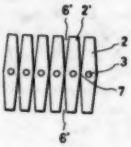
Masami Kato, Nagoya, Japan, assignor to Toska Co., Ltd., Tokyo, Japan

Original No. 4,417,656, dated Nov. 29, 1983, Ser. No. 254,755, Apr. 16, 1981. Continuation of Ser. No. 619,962, Jun. 6, 1984, abandoned. Application for reissue Oct. 3, 1985, Ser. No. 783,266

Claims priority, application Japan, Sep. 11, 1980, 55-125275

Int. Cl.[4] A44B *9/00;* B65D *85/24;* G09F *3/12*

U.S. Cl. 206—346 11 Claims



1. A cluster type tag-pin assembly comprising a plurality of tag pins, each said tag pin having a head portion, a cross bar and a filament portion which joins said head portion to said cross bar, each said cross bar including a connecting neck which extends therefrom in a direction opposite to said filament portion, said tag pins being connected through their respective connecting necks to a connecting bar at substantially right angles to said connecting neck to form an assembly of joined tag pins, said assembly of tag pins being integrally formed from a synthetic resin into a comb-like assembly as a whole, each said cross bar having opposing expanded portions defining apeces formed on opposite central parts of each side face thereof, adjacent expanded portions of said cross bars being connected to each other through said apeces of their respective expanded portions whereby all cross bars in the tag pin assembly are arranged in a sheet-like form, said expanded portions being separated when a shearing force is applied thereto, adjacent head portions of said tag pins being spaced with a gap smaller than the thickness of the head portion.

11. A cluster type tag-pin assembly comprising a plurality of tag pins, each said tag pin consisting only of a head portion, a cross bar and a filament portion which joins said head portion to said cross bar, said assembly of tag pins being integrally formed from a synthetic resin into a comb-like assembly as a whole, each said head portion having opposing side faces and side edges, each said side face having an expanded portion defining an apex formed on a central portion thereof which tapers towards the side edges of said head portion, each said cross bar having opposing sides and having an expanded portion defining an apex formed in a central part on each side thereof, each side face of each said head portion extending in a plane parallel to the plane in which each said cross bar extends, each head portion being connected to adjacent head portions only through said apeces of their respective expanded portions and each cross bar being connected to adjacent cross bars only through said apeces of their respective expanded portions wherein all head portions and all cross bars in the tag pin assembly are arranged in a sheet-like form, the taper of said apex on said side faces of said head portions being sufficiently small such that adjacent side faces immediately contact one another adjacent said side edges thereof when forced together to prevent substantial sway of said assembly, said apeces on said sides of said cross bars being sufficiently small such that adjacent cross bars immediately contact one another at the ends thereof when forced together to further prevent substantial sway of said assembly, said joined head portions and joined cross bars being separated when a shearing force is applied thereto.

Re. 32,333
A-21978 ANTIBIOTICS AND PROCESS FOR THEIR PRODUCTION

Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Reissued No. Re. 31,396, dated Sep. 27, 1983, Ser. No. 399,655, Jul. 19, 1982.

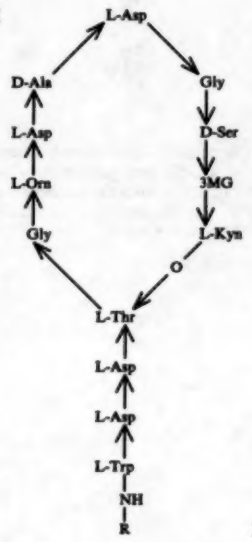
Original No. 4,208,403, dated Jun. 17, 1980, Ser. No. 951,695, Oct. 16, 1978. Application for reissue Sep. 26, 1985, Ser. No. 780,516

Int. Cl.[4] C12D *9/14;* C07C *103/52;* A61K *37/00*

U.S. Cl. 530—321 11 Claims

11. The A-21978C antibiotic complex, which is produced by submerged aerobic cultivation of Streptomyces roseosporus NRRL 11379 or an A-21978C-producing mutant thereof; and which comprises factors C_0, C_1, C_2, C_3, C_4 and C_5, which have the following structural formula:

[[



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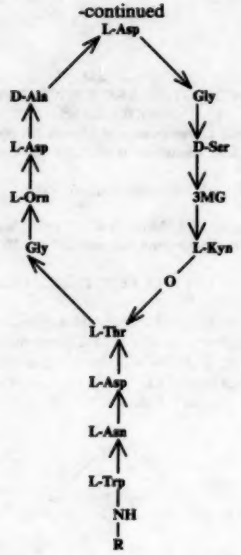


wherein 3MG represents L-threo-3-methylglutamic acid, and R represents a specific fatty acid moiety as follows: 8-methyldecanoyl (C_1), C_{10}-methylundecanoyl (C_2), 10-methyldodecanoyl (C_3), C_{10}-alkanoyl (C_0), C_{12}-alkanoyl (C_4), and [C_{13}-alkanoyl] *C_{12}-alkanoyl C_5*).

Re. 32,334

MOLDING RESINS

Edward J. Deyrup, Northeast, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,352,904, dated Oct. 5, 1982, Ser. No. 631, Jan. 5, 1979. Continuation of Ser. No. 496,938, May 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 882,219, Feb. 28, 1978, abandoned. Application for reissue Mar. 11, 1986, Ser. No. 839,455

Int. Cl.[4] C08K *5/12*

U.S. Cl. 524—292 **17 Claims**

13. A molding composition which provides articles having smooth, glossy surfaces on release from a mold consisting essentially of:

A. polyethylene terephthalate having an inherent viscosity of at least about 0.4;

B. between about 10 and about 60 percent by weight reinforcing or filling material;

C. at least one salt selected from the sodium and potassium salts of hydrocarbon carboxylic acids containing between about 7 and 25 carbon atoms, and the sodium and potassium salts of a carboxyl containing organic polymer, said salt present in an amount sufficient to provide a $\Delta H_H/\Delta H_c$ ratio of less than 0.25 to a mixture of components A, B and C;

D. at least one compound present in an amount sufficient to provide a Tpk at least 4° C. lower than the Tpk of a mixture of components A, B and C, said compound being selected from

(a) organic esters selected from the product of an aromatic carboxylic acid of 7–11 carbon atoms containing at least 1 carboxyl group per aromatic nucleus which is attached directly to said nucleus, and an alcohol selected from those of the formula $(HOCH_2\text{-}\frac{}{x}R'$ wherein x is 1, 2 or 3 and R' is a hydrocarbon radical of 2–15 carbon atoms or those of the formula $HO\text{-}(\text{-}R''O\text{-}\frac{}{y}R'''$ wherein y is a cardinal number between 1 and 15, R'' is a hydrocarbon radical of 2–15 carbon atoms, and R''' is —H or a hydrocarbon radical of 2–20 carbon atoms.

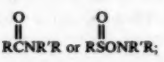
(b) organic ketones of the formula

(c) organic sulfones of the formula RSOOR,

(d) organic sulfoxides of the formula R_2SO

(e) organic nitriles of the formula RCN,

(f) organic amides of the formula



wherein in formulas (b) through (f) each R can be the same as, or different from, any other R and is a hydrocarbyl group of 1–25 carbon atoms, while in the formula in (f) R' is hydrogen or a hydrocarbyl group of 1–25 carbon atoms.

PLANT PATENTS

GRANTED JANUARY 20, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,857

ROSE PLANT—BENJEN

Frank A. Benardella, Old Tappen, N.J., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 28, 1985, Ser. No. 737,735

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by neyron rose colored flowers of varying pink tonality and pale yellow petal reverse that hold color well through development and aging.

5,858

ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Feb. 4, 1985, Ser. No. 698,222

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by rose purple flowers of good form and size borne one to a stem on an attractive, vigorous plant and having a general silvery lavender tonality from a distance.

5,859

ROSE PLANT JACLOPI

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed May 3, 1985, Ser. No. 730,153

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its rose pink buds and blooms on long, heavily prickled stems, little fragrance, long pointed leaflets.

5,860

ROSE PLANT JACALE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed May 3, 1985, Ser. No. 730,152

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its compact, upright plant habit, large blooms of light pink, white and pale yellow blend, distinct fragrance and relatively large, mildew resistant, foliage.

5,861

HEBE PLANT NAMED LAVENDER LACE

Louis E. Gavello, Richmond, Calif., assignor to Naka Nurseries, Inc., Fremont, Calif.

Filed Mar. 18, 1985, Ser. No. 712,624

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of Hebe (Veronica) plant substantially as illustrated and described, characterized as to novelty by floret color conversion from Campanula blue to white.

5,862

RAPHIOLEPIS INDICA CV. MONTO

Bill Ponto, Vista, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed May 14, 1985, Ser. No. 733,891

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—54 1 Claim

1. A new and distinct selection of Raphiolepis as substantially shown and described herein, that is characterized by large glossy bright green leaves; brown tomentum covering the new foliage and large single pink flowers fading to pure white with red filaments.

5,863

SPATHYPHYLLUM PLANT "JEANENE"

Edward B. Caldwell, 199 Townsend house Rd., Brooksville, Fla. 33512

Filed Jun. 20, 1985, Ser. No. 746,850

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of spathyphyllum plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of overall good winter color with greenish yellow upper surface of new leaves to greenish yellow surface of more mature leaves, good keeping qualities, the thick elliptic leaves being resistant to bruising with deep undulations as well as to cool weather chloroplast degradation, the plant as a whole being erect, with stiff petioles.

PATENTS

GRANTED JAN. 20, 1987

ERRATA

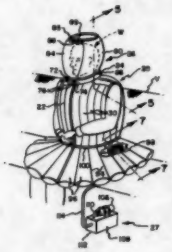
For CLASS	See PATENT NO.
106-261	4,637,464
420-073	4,637,843
427-297	4,637,952
379-145	4,638,121
379-124	4,638,122
379-229	4,638,123
381-068	4,638,125
379-427	4,638,126
333-001	4,638,267

PATENTS

GRANTED JANUARY 20, 1987

GENERAL AND MECHANICAL

4,637,074
PROTECTIVE GARMENT
Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221
Filed Mar. 17, 1986, Ser. No. 840,053
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **24 Claims**



1. A protective garment comprising:

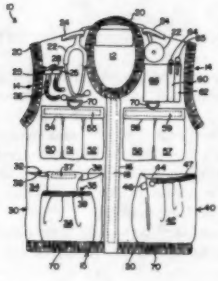
means defining a vest for substantially covering the torso of a wearer, said vest having a front, a back, two opposite sides, a neck portion and a waist portion;

a collar member attached to said vest neck portion and of such size so as to closely encircle and substantially cover the wearer's neck when the garment is operatively worn;

envelope-defining means defining an inflatable envelope connected to said collar member which, when uninflated, is maintained in a relatively compact condition adjacent said collar member and which, when operatively inflated, provides a cushioned protective sleeve which substantially and closely encircles and covers the front, back and sides of the head of the wearer and which substantially braces the wearer's neck in alignment with the torso and

means operatively associated with said envelope-defining means for inflating said envelope upon the occurrence of a predetermined event.

4,637,075
EMERGENCY MEDICAL SERVICES SYSTEM
Louis A. Ingrisano; Stephen H. Moon, both of Mount Desert, and Lawrence J. English, Manset, all of Me., assignors to Med-Vest Inc., Mt. Desert, Me.
Filed Apr. 7, 1986, Ser. No. 849,013
Int. Cl.[4] A41D *1/04*
U.S. Cl. 2—94 **20 Claims**



1. An emergency medical system (EMS) system for delivering primary care emergency treatment and EMS equipment and supplies by EMS personnel comprising:

a personnel vest constructed and organized for carrying EMS equipment and supplies in a wearable and accessible arrangement, said vest being formed with a neck, two armholes and a waist opening, and an overlapping placket at the center front of the vest extending between the neck and waist openings, said placket being formed with closure means;

quick release support loops at the shoulders of the vest for securing the ends of a stethoscope and for carrying a stethoscope around the back of the neck and on the shoulders of EMS personnel wearing the vest;

said vest comprising a plurality of outside pockets arranged on the front left and right sides of the vest with first and second large outside pockets across the front bottom left and right sides respectively of the vest for carrying bulkier EMS equipment and supplies at lower center of gravity and a plurality of intermediate size pockets across the center left and right sides of the front of the vest for carrying intermediate and smaller size EMS equipment and supplies;

at least one of said large outside pockets across the bottom front left and right sides of the vest comprising a compound pocket having a large inner pocket formed by a first pocket cover panel across the bottom of one side of the vest and an outer pocket formed by a second pocket cover panel over at least a portion of the first pocket cover panel, said large inner pocket being formed with quick release closure means across at least a portion of the top of the first pocket cover panel;

said intermediate size pockets across the center of the right and left sides of the vest being formed with quick release closure flap means over the tops of the intermediate size pockets;

small upper pockets formed on at least one side of the right and left sides of the front top of the vest at least one of said upper pockets having narrow elongate configuration for retaining elongate objects for ready access;

loop holding means formed on at least one side of the top front of the vest for holding airway means;

and a first extra-large pocket formed across the outside back of the vest comprising an extra-large pocket cover panel secured along the top and bottom across the back of the vest, said extra-large pocket being openable and accessible on the sides and formed with quick release closure means along the sides and with tabs for pulling open the sides for storing and accessing a large multi-trauma dressing pad.

20. An emergency medical response (EMS) system for delivering primary care emergency treatment and EMS equipment and supplies by EMS personnel comprising:

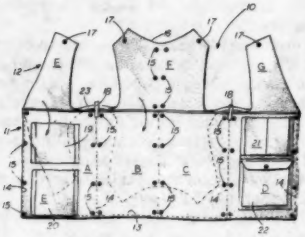
a personnel vest coinstructed and organized for carrying EMS equipment and supplies in a wearable and accessible arrangement, said vest being formed with a neck, two armholes and a waist opening, and an overlapping placket at the center front of the vest extending between the neck and waist openings, said placket being formed with quick release closure means for rapidly opening the vest;

quick release support loops at the shoulders of the vest for securing the ends of a stethoscope and for carrying a stethoscope around the back of the neck and on the shoulders of EMS personnel wearing the vest;

said vest comprising a plurality of outside pockets arranged on the front left and right sides of the vest with first and second large outside pockets across the front bottom left and right sides respectively of the vest for carrying bulkier EMS equipment and supplies at lower center of gravity and a plurality of intermediate size pockets across the center left and right sides of the front of the vest for

carrying intermediate and smaller size EMS equipment and supplies;
small upper pockets formed on at least one side of the right and left sides of the front top of the vest at least one of said upper pockets having narrow elongate configuration for retaining elongate objects for ready access;
loop holding means formed on at least one side of the top front of the vest for holding airway means;
and a first extra-large pocket formed across the outside back of the vest comprising an extra-large pocket cover panel secured along the top and bottom across the back of the vest, said extra-large pocket being openable and accessible on the sides and formed with quick release closure means along the sides and with tabs for pulling open the sides for storing and accessing a large multi-trauma dressing pad.

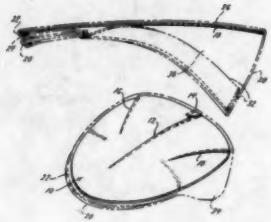
4,637,076
CONVERTIBLE VEST-BAG
Evangeline Tartt, 4916 Imperial, Bellaire, Tex. 77401, and Sandra Webber, P.O. Box 161, Farmington, Me. 04938
Filed Jul. 16, 1985, Ser. No. 755,340
Int. Cl.[4] A41D *1/04, 15/00;* **A45C** *9/00*
U.S. Cl. 2—102 **18 Claims**



1. A vest-bag which is convertible between a vest garment configuration and a bag configuration comprising:
a unit of material having a lower portion sectioned into laterally contiguous panels and an upper portion divided into a central back panel and a pair of side panels,
said lower portion formed of a multi-ply material wherein each of said contiguous panels forms a pocket with a top opening at the intersection of the upper and lower portions,
said lower portion adapted to be secured in a folded condition with said contigious panels folded one upon another,
said upper portion extending upwardly from the lower portion forming a vest bodice for wearing said vest-bag in a vest garment configuration and foldable over said lower portion to form a bag configuration capable of being supported on the shoulder,
said contiguous panels forming said open ended pockets in the vest garment configuration and defining purse-like divider panels in the folded condition.

4,637,077
FORM-RETAINING INSERT FOR CAPS
Edward W. Henschel, 13966 Meursalt La., Chesterfield, Mo. 63017
Continuation-in-part of Ser. No. 718,632, Apr. 1, 1985, abandoned. This application Mar. 7, 1986, Ser. No. 837,349
Int. Cl.[4] A42C *5/00;* **D06C** *29/00*
U.S. Cl. 2—185 B **20 Claims**

1. A form-maintaining insert for a cap which comprises a generally flat sheet of form-retaining material that has a front portion which is generally similar to the front portion of the crown of said cap and which is insertable within the front portion of said cap to underlie and to confront said front portion of said crown in face-to-face relation and that has a rear portion which is generally similar to the rear portion of said crown of said cap and which is insertable within the rear portion of said cap to underlie and to confront said rear portion of said crown in face-to-face relation, said front portion of said sheet having a curved periphery, said rear portion of said sheet having a periphery which is, at least in part, curved, said sheet having a severance line therein which extends forwardly from the rear edge of said rear portion into said front portion to define left and right areas for said rear portion which have confronting edges, said left and right areas being bowable to enable the confronting edge on one of said areas to lap over the confronting edge of the other of said areas with a consequent



reduction in the effective width of said rear portion of said insert, said insert resisting the bowing of said left and right areas of said rear portion thereof and developing restorative forces which cause said left and right areas of said rear portion to apply outwardly-directed forces to said cap, adjacent the sides of said crown, that will develop tensile forces in said crown which will resist wrinkling or creasing of said crown, said periphery of said rear portion of said sheet providing a fold-line about which the rear wall of said cap can be folded inwardly and adjacent a confronting surface of said sheet to reduce the space occupied by said cap to a desired value.

4,637,078
UNDERGARMENT FOR HANDICAPPED
Patricia C. Southwell, 3901 Leland St., San Diego, Calif. 92106
Filed May 17, 1985, Ser. No. 735,130
Int. Cl.[4] A41B *9/04*
U.S. Cl. 2—408 **1 Claim**

1. An undergarment of the panties type for the handicapped, said garment comprising:
a plurality of panels of soft pliable fabric secured together for forming an undergarment for covering the human anatomy at the juncture of the legs with the truck, and having means defining a waist opening and a pair of leg openings, said plurality of panels comprising a front panel terminating at a lower edge above the crotch;
first hook and loop fastening means secured to and extending along said lower edge;
a back panel secured to said front panel for forming a tube portion for receiving the trunk and defining said waist opening;
a releasable lower panel connected to said back panel across the crotch area and up the front and terminating at a

forward edge, said lower panel having a waterproof portion for extending across the crotch area;

second hook and loop fastening means secured to and extending along said forward edge for releasable securement to said first hook and loop fastening means at the lower edge of the front panel for covering the crotch area and for providing easy access to the crotch area of anatomy;

a pair of straps each extending along each side of the lower edge of said front panel for defining a respective leg opening, said leg openings being substantially at the juncture of the wearer's legs and trunk in the worn position and connected at opposite ends to said back panel; and

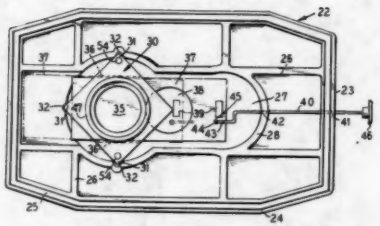
an additional inner panel extending over the crotch area and connected on opposite sides to said straps and at the top and bottom edges to said front and back panels respectively, said inner panel having a centrally disposed, access opening provided with a finished surrounding edge.

4,637,079

BACKFLOW PREVENTING ATTACHMENT FOR TOILETS

Robert R. Hodge, 3505 Burr St., Gary, Ind. 46408

Filed May 9, 1985, Ser. No. 732,412
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—427 **2 Claims**



1. A backflow preventing valve for mounting on the top of a soil pipe flange by bolts bottomed in the soil pipe flange which comprises a housing overlying the soil pipe flange having a bore therethrough registering with the soil pipe and bolt holes receiving bolts extending from the flange, a valve plate with top and bottom faces mounted in said housing across said bore and slidable longitudinally in the housing, said valve plate having an aperture selectively aligned with and displaced from the bore to open and close the bore, O-rings mounted in said housing around said bore sealingly engaging the top and bottom faces of said valve plate in all positions of the plate, and a pull rod pivoted on the valve plate in offset relation to the longitudinal axis thereof effecting relative rotation of at least one O-ring and the valve plate to break the plate away from the O-rings as the rod is pulled to slide the plate between open and closed positions thereby preventing damage to the O-rings.

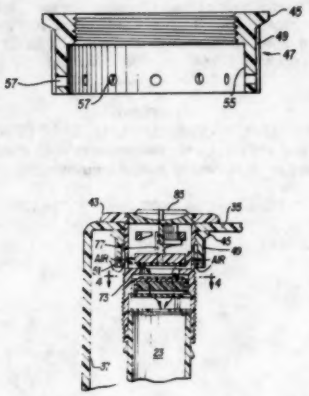
4,637,080

AIR VOLUME CONTROL

Charles H. Hutchinson, 5420 90th St., Lubbock, Tex. 79424

Filed Dec. 19, 1985, Ser. No. 816,318
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **20 Claims**

1. An air volume control for use with a flowing water line to control the quantity of air sucked by venturi action into said flowing water line; said air volume control comprising control valve means, valve seat means, float valve means; said control valve means having an open position and a closed position, said control valve means in its said open position being free from engagement with said valve seat means to thereby allow air to be sucked into said flowing water line, said control valve means in its said closed position being in leakproof positive seating and sealing engagement with said valve seat means to prevent air from being sucked into said flowing water line, said float valve means being responsive to reverse flow of water or



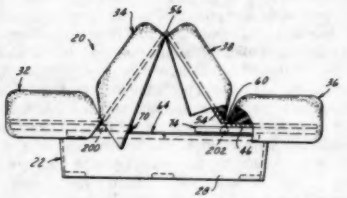
back pressure of air to automatically close said valve seat means by leakproof positive seating and sealing engagement of said float valve means with said valve seat means.

4,637,081

FOLD-DOWN SEAT CONSTRUCTION

Richard N. Clark, Farmington Hills, Mich., assignor to Tecla Company, Inc., Mich.

Filed Jul. 22, 1985, Ser. No. 757,330
Int. Cl.[4] A47C *17/06*
U.S. Cl. 5—18 R **10 Claims**



1. In an articulated back-to-back fold-down chair seat and slide-rail track construction having a pair of back-to-back chairs, each with a bottom board and backboard hinged at their mating ends and articulated at the upper abutment of the backs to operate between a full upright position, a fold-down couch position of the backs and seats and intermediate inclined positions therebetween, and wherein each of the seats are mounted on associated pairs of slides which telescopically engage associated first and second track rails affixed in laterally spaced apart relation to opposite sides of a chair platform support, the improvement wherein said rails each comprise an aluminum extrusion having in cross section an upright web integral with a T-head at its upper end and a pair of horizontally opposed flanges projecting oppositely from said web approximately midway between the upper and lower edges of said rail, and wherein said slides each comprise an aluminum extrusion having in cross section an upright web portion with a seat mounting flange integral with its upper edge and protruding horizontally therefrom upon which the seat bottom boards are mounted and a rail gripping flange protruding from said web in the opposite direction from said seat mounting flange and spaced horizontally therebelow, the underside of said gripping flange being adapted to slideably ride on the upper surface of

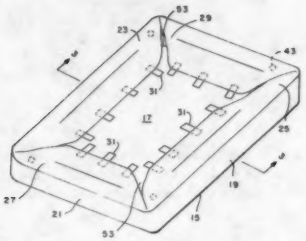
the rail T-head in telescopic assembly of said slide and rail, said outer edge of said gripping flange having a dependent flange and inturned end adapted to wrap around and embrace the associated outer edge of said T-head of the rail, said slide also having vertically spaced flanges protruding from one side of said web adapted to slideably abut the adjacent side of said rail web between said T-head and said mid-flange thereof.

4,637,082

WATERBED WITH REMOVABLE SIDE CUSHIONS

Jerry Moore, and Dennis W. Yanglin, both of Cloverdale, Calif., assignors to New World Manufacturing, Inc., Cloverdale, Calif.

Filed Mar. 26, 1985, Ser. No. 716,155
Int. Cl.[4] A47C *27/10*
U.S. Cl. 5—452 **7 Claims**



1. A waterbed comprising a water impermeable liner having a rectangular bottom portion, generally upright rectilinear peripheral portions extending from the edges of the bottom portion and extensions of said peripheral portions extending inwardly toward the center of said bottom portion, means for attaching said extensions to said bottom portion to thereby form a plurality of slings each having its loop portion parallel to one side of said rectangular bottom portion, adjacent edges of the extensions being separated from each other to provide an opening, a resilient cushion disposed in each of said slings thereby forming a rectangular peripheral support and a water bag positioned on said rectangular bottom portion within said rectangular peripheral support and overlying said means for attaching said extensions, each of said extensions defining a first linear path from the upper surfaces of the respectively enclosed cushion to the means for attaching when said water bag is empty of water and a second longer linear path from the upper surface of the respectively enclosed cushion to the means for attaching when said water bag is filled with water whereby, when said water bag is filled with water, downward pressure on said extensions tends to urge said resilient cushions inwardly.

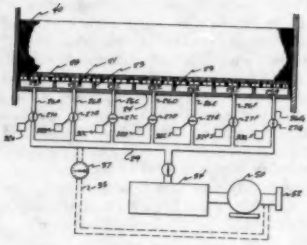
4,637,083

FLUIDIZED PATIENT SUPPORT APPARATUS

Vernon L. Goodwin, Charlotte, N.C., assignor to Support Systems International, Inc., Charleston, S.C.

Filed Mar. 13, 1985, Ser. No. 711,246
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—453 **22 Claims**

1. An improved patient support structure comprising:
(a) an open top container means;
(b) a mass of granular material received within said container means;
(c) means for supporting said granular material within said container means, said support means being porous to fluid pressure and impervious to passage of granular material;
(d) means for generating fluid pressure beneath said support means for fluidizing said granular material above said support means;
(e) means for sequentially directing at least a portion of said fluid under pressure, said means for sequentially directing being located beneath predetermined portions of said support means for fluidizing granular material thereabove; and



(f) flexible means atop said granular material for receipt of a patient thereon.

4,637,084

CRIMPING AND CUTTING TOOL

Michael D. Wood, 2301 - 139th Ave., N.W., Anoka, Minn. 55303

Continuation-in-part of Ser. No. 193,534, Jan. 3, 1980, abandoned. This application Dec. 6, 1984, Ser. No. 678,968
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—134 **25 Claims**

1. A connector crimping and wire cutting tool useable for connection of a ferrule type connector to an electrically conductive wire, comprising: a first lever member having a first head and an elongated first handle, said first head having a first crimping jaw positioned at substantially a right angle relative to the first handle, and a first wire cutting jaw positioned at substantially a right angle relative to the first handle and opposite the first crimping jaw; a second lever member with a second head and an elongated second handle extending from the second head, said second head having a second crimping jaw positioned at substantially a right angle relative to the second handle, and a second wire cutting jaw positioned at substantially a right angle relative to the second handle and opposite the second crimping jaw; pivot means pivotally assembling the first and second lever members with the first and second handles positioned for rotational movement toward one another to a closed position and away from one another to an open position with corresponding rotational movement of the first and second crimping jaws toward and away from one another between closed and open positions, and corresponding rotational movement of the first and second cutting jaws toward and away from one another between closed and open positions to cut wire, said pivot means being located below said

crimping and cutting jaws of the first lever member whereby the lever arm of the first cutting jaw is longer than the lever arm of the second cutting jaw; said first crimping jaw having alternating teeth and arcuate recesses in facing relationship to the second crimping jaw, said second crimping jaw having alternating teeth and arcuate recesses in facing relationship to the first crimping jaw, said teeth of the first and second crimping jaws having concave curved sides and being progressively shorter in length from the inside tooth to the outside tooth with respect to the pivot means, and said recesses of the first and second crimping jaws being progressively smaller in curvature from the inside recess to the outside recess with respect to the pivot means; said teeth and recesses of the crimping jaws so positioned that in the closed position teeth of the first crimping jaw occupy the space defined by the arcuate recesses of the second crimping jaw, and teeth of the second crimping jaw occupy spaces defined by the arcuate recesses of the first crimping jaw whereby a tooth of one jaw and a corresponding arcuate recess of the opposite jaw are useable to crimp the ferrule of an electrical connector.

4,637,085

JOINT SPANNING CONSTRUCTION FOR BRIDGES OR SIMILAR STRUCTURES

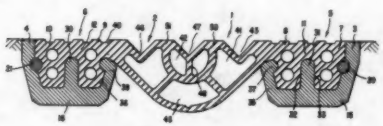
Alfred Hartkorn, Kolpingstrasse 25, D-8068 Pfaffenhofen, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,361

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1984, 34160809

Int. Cl.[4] E01D *19/06*; E01C *11/02*

U.S. Cl. 14—16.5 **7 Claims**



1. A joint spanning construction for bridges or similar structures with which sealing bodies, flush with the top surface of the road and made of resilient rubber material, are inserted by means of beading from above into recesses of sills or threshold pieces and, should the occasion arise, of movable intermediate girders, and secured against lifting out by retainer bodies which are basically of circular cross-section and fit partly in a wall of the sill recess and partly in the beading, wherein the sills or intermediate girders have a base substantially parallel with and beneath the road surface, and are provided with webs having sides extending upwardly substantially parallel to each other, directed towards the road surface and projecting into the beading, an outer of said webs having a concave recess facing a mirror-image concave recess in said sealing body, and an inner of said webs having a semicircular upwardly facing end, and the sealing body having sections separated by the webs, each section provided with concave recesses opposite to the web(s), the outer recess is engaged by the retainer body, and the inner recess is engaged by the inner web semicircular end.

4,637,086

SWIMMING POOL VACUUM CLEANER

John Goode, 9767 Commanche Ave., Chatsworth, Calif. 91311

Filed Jan. 11, 1985, Ser. No. 690,774

Int. Cl.[4] E04H *3/20*

U.S. Cl. 15—1.7 **5 Claims**

1. A moveable suction head assembly for sweeping swimming pool bottoms comprising:

A. a weighted rectangular central platform, horizontally oriented, incorporating a plurality of rollers so as to form a clearance between the lower surface of said central platform and the pool bottom, the rollers permitting straight line travel;

B. a vertical opening communicating with said clearance with provision at its top end for attachment to a vacuum disposal system;

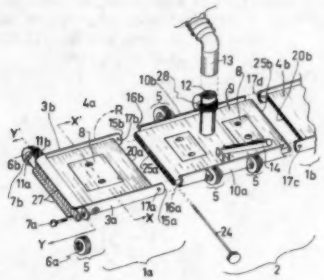
C. a pivoted push rod mounted on the top surface of the central platform by which it can be propelled from above the surface of the pool;

D. low leakage coupling components mounted on those borders of said central platform which are parallel to the direction of travel and constitute its sides;

E. baffles mounted on those borders of said central platform which are perpendicular to the direction of travel and constitute the leading and trailing edges of the central platform, said baffles extending vertically an equal distance above and below the central platform;

F. two weighted rectangular end platforms each incorporating

i. a plurality of rollers permitting straight line travel and forming a clearance with the bottom of a swimming pool;



ii. low leakage coupling components on one of the borders of the end platform which is parallel to its direction of travel;

iii. two horizontal bumper strips defining upper and lower strips mounted on the border opposite that holding the low leakage coupling components;

iv. baffles mounted on those borders of said end platform which are perpendicular to its direction of travel and constitute the leading and trailing edges, the baffles extending vertically an equal distance above and below the end platform;

whereby one end platform may be attached to each side of the central platform by said coupling components to make up a suction head assembly of increased width and whereby water flow drawn under all the baffles into the clearances is restricted and thus increases temporarily in velocity, an effect which forms suspensions of solid materials found on the bottom and which facilitates solids removal as the suction sweep head is pushed along the bottom.

4,637,087

SWIMMING POOL CLEANER ATTACHMENT

Andrew S. Feinberg, 4971 Vista Del Monte, El Paso, Tex. 79922

Filed Aug. 30, 1985, Ser. No. 770,925

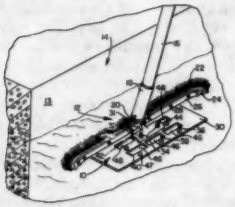
Int. Cl.[4] E04H *3/20*

U.S. Cl. 15—1.7 **8 Claims**

1. An attachment for increasing the cleaning efficiency of a pool cleaning device which has a pole for moving the device, the attachment comprising:

a foil connected to the pole for urging the device against a pool wall when the pole is pushed down through the water in the pool; and

one-way valve means mounted to the foil for allowing flow through the foil when the pole is withdrawn from the



water, thus minimizing water forces on the foil necessary for pole withdrawal.

4,637,088

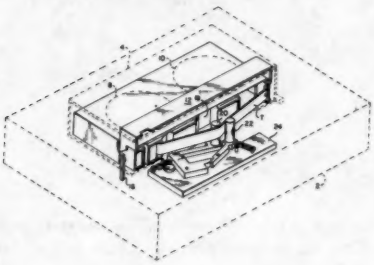
TAPE CLEANING MACHINE

John A. Badaracco, 21 Kilburn Rd., W. Newton, Mass. 02165, and Henry A. Martin, 8 Melo Rd., Woburn, Mass. 01801

Filed Jun. 20, 1984, Ser. No. 622,774

Int. Cl.[4] B08B *11/02*

U.S. Cl. 15—97 R **11 Claims**



1. In combination:

a cassette handling machine, a cassette having a band of flexible tape which is moveable from a supply reel to a take-up reel in a predetermined path;

means for locating the cassette in normal operative position in the machine;

means for cleaning the tape while the cassette is in the machine and the tape is moving from reel to reel;

said means for cleaning comprising heads engageable with opposite sides of the tape and located, relative to the normal operating position of the cassette, in inoperative cleaning positions and out of contact with the tape; and,

means for moving the heads into engagement with the tape to apply cleaning action simultaneously to both sides of the tape as it moves from reel to reel.

4,637,089

DEVICE FOR CLEANING LIGHT WAVEGUIDE PLUG CONNECTOR PARTS

Johann Schwarz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,021

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 8423218[U]

Int. Cl.[4] B08B *11/00*

U.S. Cl. 15—118 **10 Claims**

1. A device for cleaning light waveguide plug connector parts wherein, at an end of a rod-shaped member, a wick of optical-fiber-compatible material seated in a cavity of said member and guided in a pin-shaped section of said member has a free end conducted out of said member such that said free end of said wick projecting from said member can be crushed to

form a cleaning stopple, said member comprising a hollow-cylindrical region at its other end; and having a further wick seated in said member loosely penetrating said hollow-cylindrical region and having its free end bent around a free edge of said hollow-cylindrical region.

4,637,090

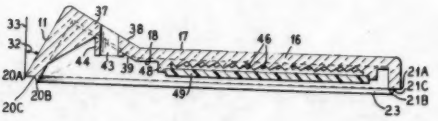
PLASTIC SCRAPER

Jim Kennedy, 324 Streamwood Blvd., Streamwood, Ill. 60103

Filed Apr. 15, 1985, Ser. No. 723,174

Int. Cl.[4] A47L *1/06*; B60S *1/04*

U.S. Cl. 15—236 R **10 Claims**



1. A molded scraper for removing deposits from surfaces comprising:

(A) a central generally flattened plate portion having generally opposed front and back faces and having a polygonal straight sided perimeter configuration,

(B) a plurality of integral flange-like continuous extensions upstanding from said back face along said sides and terminating in generally straight blade portions which are generally mutually coplanar with one another,

(C) at least one of said straight blade portions having defined therein a pair of longitudinal continuously extending edge members in spaced parallel relationship to one another,

(D) the interrelationship between said edge members of each such pair being such that both of said edge members generally contact a flattened surface when said central plate portion is inclined relative to said surface at a predetermined first acute angle,

(E) at least one of said extensions being oriented at a predetermined second acute angle relative to said central plate portion,

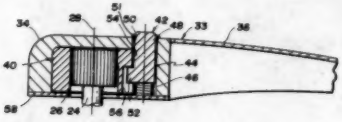
(F) each said at least one extension terminating in space relationship to said blade portion thereof at a location elevated with respect to said front face, and

(G) a finger abutting plate portion means integrally associated each of said at least one extension terminating locations both with said central plate portion and with adjacent areas of others of said extensions, said finger abutting plate portion means being oriented spacially and, configured to have a front face portion thereof extend generally parallel to said surface when said central plate portion is so inclined.

4,637,091
WIPER ARM ASSEMBLY AND SYSTEM UTILIZING SAME

Leonard L. Wu, Livonia, Mich., assignor to American Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1985, Ser. No. 749,528
Int. Cl.[4] B60S 1/34
U.S. Cl. 15—250.34 15 Claims



1. A window cleaning system for a vehicle having a glass window of the type in which a pane of glass is movable between an open position and a closed position, the system comprising:

wiper means mounted on the vehicle and movable from a park position through a range of travel over the glass window to define a wipe pattern having first and second limit position for wiping the glass window free of matter deposited thereon, said wiper means including a wiper arm pivotable about a pivot axis and a wiper blade assembly secured to the wiper arm;

drive means including a drive shaft pivotable about the pivot axis and a wiper arm driver fixedly mounted on a free end of said drive shaft to rotate therewith whenever the drive shaft pivots about the axis, said wiper arm driver being pivotable about the pivot axis, the drive means being mounted on the vehicle for providing a source of controlled drive power to move the wiper means along the wipe pattern; and

coupling means for alternately coupling said wiper arm to said wiper arm driver in first and second angular positions angularly spaced about the pivot axis to permit movement of said wiper means between said first and second limit positions during normal operation and to the park position wherein said coupling means includes a cam releasably mounted on said wiper arm driver to rotate therewith whenever the wiper arm driver pivots about the pivot axis and locking means for alternately locking said wiper arm to said cam in one of said first and second angular positions.

4,637,092
VACUUM CLEANER WITH AGITATOR

Seizo Hayashi, Oumi Hachiman; Kenji Okano, Youkaichi, and Nobuhiro Hayashi, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 30, 1985, Ser. No. 696,562
Claims priority, application Japan, Jan. 31, 1984, 59-16627
Int. Cl.[4] A47L 9/28
U.S. Cl. 15—319 17 Claims

1. A vacuum cleaner of the type arranged to drive a rotary brush disposed in a floor nozzle of said vacuum cleaner, comprising:

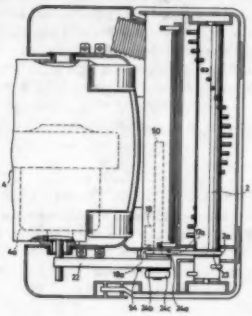
(a) an electric motor for driving said rotary brush;

(b) a manually operable power switch for connecting said electric motor to a power source;

(c) first means for detecting rotation of said rotary brush, said first means producing an output voltage only when detecting the rotation of said rotary brush;

(d) second means responsive to said power switch for producing a voltage across a resistor for a given period of time after said power switch is turned on;

(e) latching means responsive to both said output voltage from said first means and said voltage across a resistor of said second means for producing a control voltage when neither of said output voltage nor said voltage across said resistor is applied thereto; and

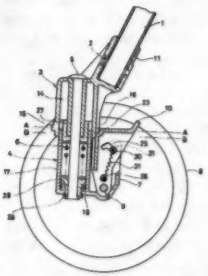


(f) a control unit responsive to said control voltage for controlling electrical input to said electric motor such that no power is fed to said electric motor in the presence of said control voltage.

4,637,093
SPRING CUSHIONED CASTER HAVING A SPRING BIASED LOCKING MEMBER

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Nov. 19, 1984, Ser. No. 672,708
Claims priority, application Japan, Dec. 1, 1983, 58-185973[U]
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.[4] B60B 33/00
U.S. Cl. 16—35 R 5 Claims



1. A caster comprising: a fixed bracket (3) to be attached to an object (1) for rolling the object with the aid of the caster, a vertically extending shaft (5) held by said fixed bracket (3), a rotary yoke (4) supported by said shaft (5) for rotation around a vertically extending axis relative to said fixed bracket (3) and for vertical movement relative to the fixed bracket (3), said fixed bracket (3) comprising a lower end and an opening (13) in said lower end of said fixed bracket, said rotary yoke (4) having an upper end received in a telescoping manner in said opening (13) in said lower end of said fixed bracket for supporting said rotary yoke for vertical movement of said rotary yoke (4) relative to said fixed bracket (3), said rotary yoke having a laterally extending bearing bracket (7), a cushion spring (6) acting between said fixed bracket (3) and said rotary yoke (4) for downwardly urging said rotary yoke, a horizontally extending axle (9) supported in said bearing bracket (7) at a position horizontally spaced from said vertical shaft (5), said caster further comprising a locking lever (10) supported on

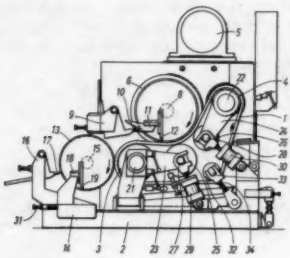
said horizontally extending axle (9), said axle (9) forming a journal shaft for said locking lever (10) in said bearing bracket (7) of said rotary yoke (4), whereby said locking lever (10) is rotatable in a predetermined range about said journal shaft into a locking engagement with said fixed bracket (3) for preventing rotation of the rotary yoke (4) around said vertically extending axis, said locking lever and said fixed bracket comprising cooperating relative rotation preventing members permitting a vertical movement of said rotary yoke in response to a cushioning action of said cushion spring.

4,637,094

APPARATUS FOR COLLECTING FLESH OF FISH

Kaneo Matsubayashi, Kishiwada, Japan, assignor to Toyo Suisan Kikai Co. Ltd. and Taiyo Fishery Co. Ltd., both of, Japan

Filed May 10, 1985, Ser. No. 732,631
Claims priority, application Japan, May 12, 1984, 59-94993
Int. Cl.[4] A22C *17/00, 25/00*
U.S. Cl. 17—1 G 3 Claims



1. An apparatus for collecting flesh of fish comprising:

an endless belt having a conveying side for conveying the flesh of the fish;

a first rotatable hollow roll having a peripheral wall with a plurality of flesh collecting holes therein, said first roll being generally horizontally disposed, closed at one end and open at the other end;

a first contact pressure adjusting means for holding the conveying side of said endless belt in a selected pressing contact with a lower pressing portion of the peripheral wall of said first roll such that flesh of a high quality adjacent said first roll is collected by said first roll while lower quality flesh beneath the high quality flesh is not collected, and for holding the conveying side of said endless belt out of contact with a lower non-contact portion of said first roll downstream of said lower pressing portion below which a drop portion of said endless belt is thereby disposed;

a second rotatable hollow roll having a peripheral wall with a plurality of flesh collecting holes therein, said second roll being generally horizontally disposed, closed at one end, and open at the other end;

a second contact pressure adjusting means for holding the conveying side of said endless belt downstream of said first roll in a selected pressing contact with a pressing portion of the peripheral wall of said second roll such that additional flesh not collected by said first roll is collected by said second roll;

a first scraping knife disposed along the lower non-contact portion of said first roll in sliding contact with the peripheral surface of said first roll such that said first knife is located above the drop portion of said endless belt to cause flesh adhering to said first roll after pressing thereby to fall onto said drop portion of said endless belt and be conveyed to said second roll; and

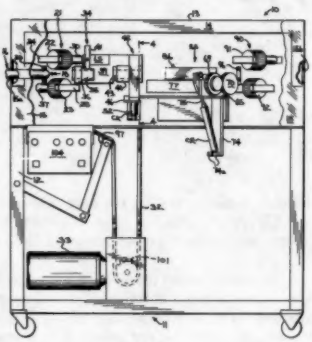
a second scraper knife in sliding contact with the peripheral surface of said second roll to cause flesh adhering to said second roll to be scraped therefrom.

4,637,095

METHOD AND APPARATUS FOR PEELING SAUSAGE

Gerald F. Maruska, 329 Cheyenne Trail, Madison, Wis. 53705

Filed Dec. 11, 1985, Ser. No. 808,269
Int. Cl.[4] A22C *11/00, 13/00*
U.S. Cl. 17—49 13 Claims



1. A method for removing a casing from a body of a sausage having a leading end and a trailing end, wherein the casing is formed with a tuft on the leading end of the body, the method comprising:

feeding the body of the sausage forward along a feed path through a feeding station;

causing a cut to be made in the casing;

at a casing removal station downstream of the feeding station, encountering the leading end of the sausage head-on, gripping the tuft of the sausage, and then pulling the tuft radially outward from the body of the sausage to separate the casing from the body as the body is fed further along the feed path; and

feeding the trailing end of the body past the casing removal station to allow removal of the casing from the trailing end of the sausage.

4,637,096

METHOD AND APPARATUS FOR CLEANING COTTON

Dan S. Wise, Kings Mountain, and George A. Miller, Dallas, both of N.C., assignors to Wise Industries, Inc., Kings Mountain, N.C.

Filed Oct. 18, 1985, Ser. No. 789,146
Int. Cl.[4] D01G *1/00*
U.S. Cl. 19—200 10 Claims

1. A method of cleaning cotton or the like comprising:

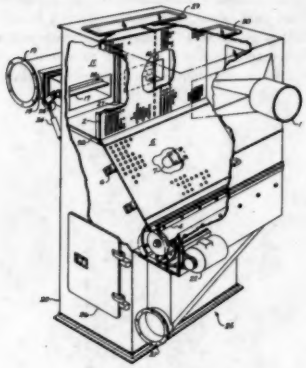
(a) directing an air stream bearing cotton into a chamber;

(b) drawing said air stream and dirt in said cotton through only a first portion of an air pervious member imposed within the chamber;

(c) collecting the cotton on the upstream side of the first portion of said air pervious member;

(d) drawing said air stream and dirt within the cotton through only a second portion of said air pervious member and at the same time ceasing to draw the air stream through said first portion of said member; and

(e) collecting the cotton on the upstream side of said second portion of said air pervious member and at the same time,



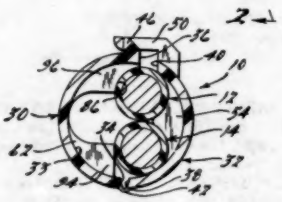
removing the cotton from said first portion of said air pervious member.

4,637,097

CABLE BUNDLER CLIP

Nelson W. Secord, Brighton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 21, 1985, Ser. No. 789,856
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—16 PB **4 Claims**



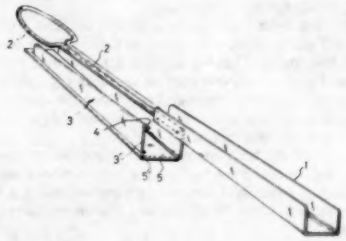
1. In a cable bundler clip comprising a pair of clip halves, each clip half having a pair of longitudinal edges, a hinge connecting adjacent edges of the clip halves thereby hingedly joining the halves together, the hinge permitting the clip halves to be swung to a closed position wherein the other edges of the clip halves substantially meet to define an inner tubular surface for enclosing a plurality of cables, latching structure on the clip halves for securing the clip halves together in the closed position, the improvement comprising rib structure within each of the clip halves, the rib structure within one clip half being oppositely disposed from the rib structure in the other clip when the clip halves are in the closed position, the rib structure of one clip half having first and second side-by-side recesses formed therein, the rib structure of the other clip half having a third recess formed therein, the third recess being located centrally of the first and second recesses when the clip halves are in the closed position, rib structure material of said other clip half being provided on each side of the third recess, said rib structure material overlapping the first and second recesses when the clip halves are in the closed position, each of the recesses adapted to receive a cable, the overlapping rib structure material of said other clip half securely capturing cables received in the first and second recesses when the clip halves are in the closed position, cables received in the first and second recesses securely capturing a cable received in the third recess when the clip halves are in the closed position.

4,637,098

SHIM USED FOR CABLE CLAMP

Masahiko Okura, and Minoru Inayashi, both of Tokyo, Japan, assignors to Okura Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,713
Int. Cl.[4] F16G *11/04*
U.S. Cl. 24—136 R **1 Claim**



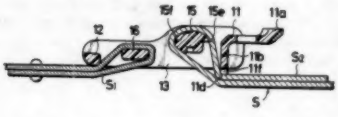
1. In a cable clamp comprising
an elongated transversely U-shaped tapered body member (3) having inturned flanges (4) along the marginal edges of the sides thereof to form guides;
an elongated transversely U-shaped tapered wedge member (1) slidably positioned within said body member and having its marginal edges located in said guides;
a suspending ring member (2) secured to said wedge member; and
shim member (5) disposed within said body member, the improvement comprising
said shim member comprising a substantially flat elongated plate having a slit (5') extending along one side thereof and of a dimension to fit around one side (3') of said body member (3), such that one part of said shim member is located on the outside of said side (3') of said body member, and the remaining part of said shim member is located inside of said body member, whereby (see FIG. 6) manual pushing of said one part of said shim member enables rotation of said shim member about a pivot point of said slit from a position whereat the shim member is flat against the bottom of said body member to another position whereat the shim member is against the side (3') of said body member.

4,637,099

ADJUSTABLE STRAP FASTENER

Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,378
Claims priority, application Japan, Dec. 26, 1984, 59-198836[U]
Int. Cl.[4] A44B *11/04*
U.S. Cl. 24—200 **2 Claims**



1. A strap fastener molded of a plastic material for adjustably connecting ends of a strap, comprising:
(a) a grip head portion;
(b) a pair of parallel spaced side flanges extending from said grip head portion in a common direction and having a pair of flat bottom surfaces, respectively;
(c) a connecting portion extending between and interconnecting said side flanges;
(d) a pair of parallel spaced first and second cross bars ex-

tending parallel to said connecting portion and connected to said side flange portions, said first cross bar being disposed closer to said grip head portion than said second cross bar;

(e) a retainer portion extending integrally from said head portion perpendicularly to the plane of the fastener and projecting beyond said bottom surfaces of said side flanges, said retainer portion having a flat bottom surface and defining a first strap stop;

(f) said first cross bar having a first projection extending toward said grip head portion and defining a second strap stop and further having a second projection extending toward said connecting portion and defining a third strap stop, said retainer portion and said second strap stop being spaced from one another by a distance larger than the thickness of the strap; and

(g) said first cross bar lying at a level above said second cross bar, said second cross bar lying at a level above said connecting portion, said connecting portion having a lowermost surface lying flush with said bottom surfaces of said flanges.

4,637,100

HOSE CLAMPING DEVICE

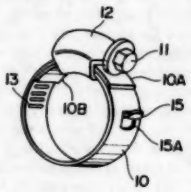
Takato Ishihata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 28, 1986, Ser. No. 856,379

Claims priority, application Japan, May 24, 1985, 60-77509[U]

Int. Cl.⁴ B65D *63/02*

U.S. Cl. 24—274 R **9 Claims**



1. A hose clamping device comprising:

a steel clamp band adapted to be tightened around an elastic hose in a ring-like form such that one end underlies the other;

tightening means provided on a portion of said band near the underlying end thereof and adapted to pull or push said overlying end, thereby tightening or loosening said band on said hose; and

a stopper provided on a portion of said band ahead of said overlying end and adapted to be contacted by said overlying end to stop the advance of the same;

said stopper comprising a tab-like portion cut out from a portion of said band and raised such that the upper surface thereof faces the advance of said overlying end of said band, so as to be pressed down towards said cut out by said overlying end when said stopper is forcibly engaged by said overlying end.

4,637,101

ACTUATOR WITH OSMOTIC PRESSURE ACTUATION

Leslie C. Fiedler, 420 W. Coolidge Dr., San Gabriel, Calif. 91775

Filed Jan. 5, 1983, Ser. No. 455,650

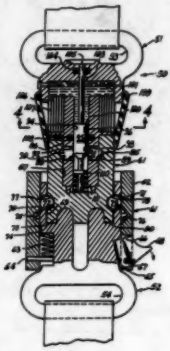
Int. Cl.⁴ B64D *17/32*

U.S. Cl. 24—602 **5 Claims**

1. In combination: a sensor for detecting and responding to the presence of a suitably concentrated liquid solution with a pre-selected concentation of a solute comprising:

a rigid case having an internal wall forming a rigid internal chamber to contain liquid of lesser or no concentration of said solute and through the said wall an exit port entering said chamber:

a closure incorporating a membrane possessing osmotic properties closing said exit port, said membrane occluding at least part of said exit port, whereby liquid leaving said chamber must pass through the membrane; and actuator means responsive to a lowered pressure caused by exit of liquid from the chamber because said membrane contacts



a liquid of at least said pre-selected concentration of solute to result in osmotic flow tending to dilute the last named liquid, said actuator means comprising:

an axially movable plunger slidingly fitted in an aperture in the wall of the case, entering in and exposed to pressure in said chamber, and exposed externally to a different pressure: and

a separation mechanism responsive to the position of said plunger.

4,637,102

SAFETY BELT BUCKLE FOR VEHICLES

Leonid O. Teder; Tiit A. Org; Vaino G. Lauri, and Ants J. Aas, all of Tallin, U.S.S.R., assignors to Proizvodstvennoe Obiedinenie "Norma", U.S.S.R.

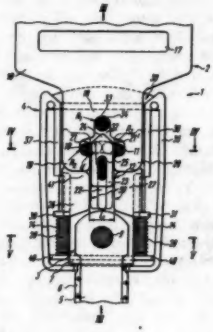
PCT No. PCT/SU84/00050, § 371 Date May 22, 1985, § 102(e) Date May 22, 1985, PCT Pub. No. WO85/01483, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 13, 1984, Ser. No. 763,136

Claims priority, application U.S.S.R., Oct. 3, 1983, 3649101; France, Oct. 2, 1984, 84 15128

Int. Cl.⁴ A44B *11/14*

U.S. Cl. 24—642 **16 Claims**



1. A safety belt buckle for vehicles, comprising

two interlocking parts, a latch part and a catch part,

said latch part including a shell formed by two substantially parallel plates disposed inside a housing and connected to a bar secured to a vehicle body, locking elements in the form of rolls movably disposed in said shell, spring-biased members for stopping said rolls in both latched and unlatched positions of the buckle, and a member for unlatching the buckle in the form of a push-button and being slidable along said shell,

said catch part in the form of a prong having a slot to receive the belt and additionally having a substantially flat portion insertable into said shell and provided at an end thereof with substantially symmetrical lugs engageable with said rolls,

wherein substantially coaxial slots extending substantially transversely with respect to a central axis of said shell, are provided in said plates, said slots adapted to receive said rolls,

substantially coaxial slots which extend substantially in line with said central axis of said shell, are also provided in said plates,

said member for stopping said rolls in the latched position of the buckle being in the form of a wedge rigidly connected through said axially-extending slots with said push button and having a tapered end facing said rolls,

said member for stopping said rolls in the unlatched position of the buckle, having the form of plate-like pushing elements situated at sides of said plates forming said shell and for engagement with an end face of said portion of said prong insertable into said shell and with said rolls,

and wherein said prong additionally comprises a shaped recess open at the end face of said insertable portion, said recess defining said lugs of said insertable portion of said prong, such that said lugs face one another.

4,637,103

SIMULTANEOUS BIAXIAL STRETCHING MACHINE FOR THERMOPLASTIC FILM WEBS

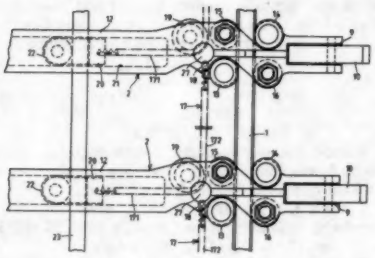
Armin Hutzenlaub, Wiehl, Fed. Rep. of Germany, assignor to Kampf GmbH & Co. Maschinenfabrik, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,581

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3503909

Int. Cl.⁴ B29L *55/16*

U.S. Cl. 26—73 **15 Claims**



1. A simultaneous biaxial stretching machine for thermoplastic film webs, comprising:

two transport rails each arranged on a border of the film web,

two guide rails each extending adjacent to a transport rail at a variable, adjustable distance, and

gripping devices disposed on said transport rails for gripping the borders of the film web, each gripping device comprising:

gripping means for gripping the film web,

roller means for moving the gripping device along its transport rail,

flexible connecting elements coupling the gripping device to adjacent gripping devices,

a deflection roller for deflection of a connecting element coming from an adjacent gripping device, and

an extension arm oriented perpendicularly to the moving direction of the gripping device on the transport rail, said extension arm having a slide mounted on a guide rail and connected to the deflected end of the connecting element.

4,637,104

APPARATUS FOR SPREADING OUT A PLURALITY OF FILAMENTS

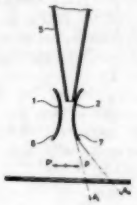
Kürt Mente, Hanover, Fed. Rep. of Germany, assignor to J. H. Benecke GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,838

Int. Cl.⁴ D01D *11/02*

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 3504588[U]

U.S. Cl. 28—283 **5 Claims**



1. An apparatus for distributing fiber from a source by pneumatic feed means, including a nozzle having an outlet and baffle means disposed adjacent to said nozzle, the improvement comprising, said baffle means including walls disposed on opposite sides of said outlet, said walls being rigidly connected so as to be movable together along a path in reciprocating motion, each said wall having an edge remote from said outlet with each said edge having a midpoint with a recess being formed in each said edge about each said midpoint.

4,637,105

STRINGTAPE ROLL FOR VENETIAN BLINDS

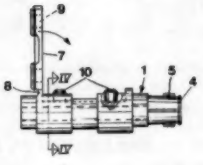
Inge Nordin, Hisings-Backa, Sweden, assignor to Pede AB, Hisings-Backa, Sweden

Filed Oct. 3, 1985, Ser. No. 783,661

Claims priority, application Sweden, Oct. 3, 1984, 8404939

Int. Cl.⁴ B23D *19/04*; E06B *9/38*

U.S. Cl. 29—24.5 **4 Claims**



1. A stringtape roll for Venetian blinds having a through channel for receiving and for being nonrotatably connected to the tilting rod of the Venetian blind and being designed with a slotted and tapering end portion and provided with means for axially locking the stringtape roll to the tilting rod and with arresting means for arresting the stringtapes of the Venetian blind, which arresting means is constituted by a tongue formed integral with the stringtape roll and bendably connected thereto and arranged to be bent to contact against the stringtape roll, wherein,

the connection between the stringtape roll and the said

tongue is a hinge, and that the stringtape roll at a distance from said hinge is provided with means intended for locking interconnection with corresponding means at the end of said tongue remote from said hinge, said means being projections and recesses resp. adapted to lock into each other for interconnection with the stringtape roll at a distance from said hinge thereby effecting an arresting of the stringtapes, which are arranged about said stringtape roll over the distance between said hinge and the free end of said tongue, and that the means for axially arresting the stringtape roll on the tilting rod is a ring having an inner diameter, smaller than the outer diameter of a rib-formed collar provided on the slotted end of the stringtape roll in unloaded condition, but somewhat bigger than the diameter thereof when the said end is in compressed condition.

4,637,106

PROCESS FOR THE PRODUCTION OF A LAMINATED CAPACITOR

Daniel Bernard, Seurre, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

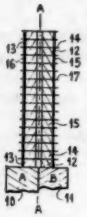
Filed Jul. 3, 1984, Ser. No. 627,527

Claims priority, application France, Jul. 6, 1983, 83 11258

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] H01G *4/32*

U.S. Cl. 29—25.42 **9 Claims**



1. A process for the production of laminated capacitors constituted by a stack of dielectric sheets separated by metal layers, plates or foils, those of the even and uneven rows being respectively interconnected by lateral electrical connections, wherein:

a—n juxtaposed master capacitors are produced by stacking dielectric sheets separated by metal layers, plates or foils on the same support,

b—a common interalated layer is placed on the n master capacitors,

c—on said common intercalated layer is placed a further group of n juxtaposed master capacitors, whose edges are substantially aligned with those of the preceding stage in the same stack,

d—m stages of n master capacitors are successively produced in this way,

e—the two lateral edges of the assembly undergo metal spraying,

f—separation takes place parallel to the metal sprayed lateral edges between two successive stacks of master capacitors, so as to produce two groups of master capacitors having a metal sprayed lateral edge and a lateral edge which is not metal sprayed,

g—the other lateral edge of each group is metal sprayed,

h—stages f and g are recommenced if necessary, so as to obtain n groups of m master capacitors, whereof the two lateral edges are metal sprayed,

i—the master capacitors are separated from one another.

4,637,107

MACHINING MACHINE

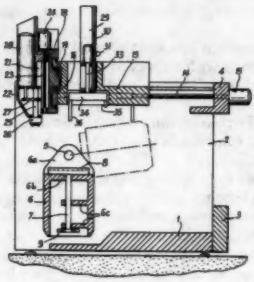
Ramon Romeu, La Segarie, Saint-Jean-Lespinasse, 46 400 Saint Cere, France

PCT No. PCT/FR85/00034, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/03893, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 27, 1985, Ser. No. 795,360

Int. Cl.[4] B23C *1/00*; B23P *23/02*; B23Q *1/16*

U.S. Cl. 29—27 C **10 Claims**



1. A machining machine for a workpiece comprising:

a machine frame including two parallel vertical posts in the form of walls having tops, the tops of said walls providing two parallel horizontal upper slideways;

a general slide extending transversally in relation to said posts and being movable along said slideways, said slide having mounted thereon a machining tool means for machining the workpiece including a turning means and at least another tool means;

a cradle mounted on said posts to be movable about a horizontal pivot axis beneath said general slide;

a table for receiving the workpiece to be machined, said table being rotatively mounted on said cradle about a rotary turning axis which is perpendicular to said horizontal pivot axis; and

a mounting means which is mounted on said general slide, said mounting means mounting said machine tool means for movement in the three directions in space so that said machine tool means are moved toward said table while said table is also movable within a wide range of inclination of said cradle relative to the horizontal pivot axis of said cradle.

4,637,108

PALLET CHANGER

Kazushi Murata, Nishio; Toshiharu Takashima, Chiryu, and Kunimichi Nakashima, Anjoh, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariay, Japan

Filed Aug. 29, 1985, Ser. No. 770,580

Claims priority, application Japan, Sep. 24, 1984, 59-199758

Int. Cl.[4] B23Q *41/02*; B65G *47/00*

U.S. Cl. 29—33 P **6 Claims**

1. A pallet changer for a machine tool, including:

a base;

a rotary plate provided on said base for rotation about a vertical axis;

a plurality of pallet supports mounted for rotating integrally with said rotary plate, said pallet supports being disposed around said vertical axis;

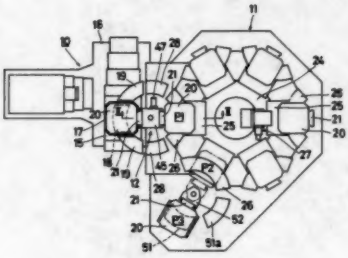
an indexing means for selectively indexing said plural pallet supports to a pallet changing position opposite a table of the machine tool;

pallets for mounting a workpiece to be machined, one of said pallets being carried on each of said pallet supports;

a first arcuate pallet guide for guiding the pallets along an arcuate track attached to each of said pallet supports;

a second arcuate pallet guide provided on said table of the machine tool for guiding the pallets along an arcuate track;

a plurality of third arcuate pallet guides which are provided for connecting as a single circular track the first pallet guide on one of said pallet supports indexed to said pallet changing position and the second pallet guide on said table, wherein said plural third pallet guides include a pair



of fixed pallet guides positioned adjacent both ends of said first pallet guide on said one pallet support which has been indexed to said pallet changing position; and

a pallet turning device for turning the pallet on said one pallet support in said pallet changing position and the pallet on said table simultaneously in one direction along the circular track completed by said first, second and third pallet guides, said pallet turning device being provided between said pallet changing position and said table of the machine tool.

4,637,109

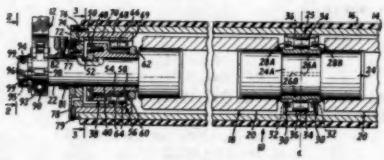
CONTROLLED DEFLECTION ROLLER

Jack Bryer, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Continuation of Ser. No. 492,477, May 6, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,561

Int. Cl.[4] B21B *13/02, 31/32*

U.S. Cl. 29—116 AD **5 Claims**



1. A roller adapted to engage and cooperate with a tangential cylinder disposed with its axis substantially parallel with the axis of the roller, the movement of the roller into engagement with the tangential cylinder tending to flex the intermediate portion of the roller away from the tangential cylinder, comprising a continuous hollow cylinder mounted for rotation about the axis thereof and engageable with said tangential cylinder, a control shaft disposed within the hollow cylinder, eccentric means mounted on the control shaft intermediate the ends of the hollow cylinder for exerting a radial force on the hollow cylinder tending to flex the intermediate portion of the hollow cylinder toward the tangential cylinder, thereby improving the uniformity of the engagement between the hollow cylinder and the tangential cylinder, means locking the ends of the control shaft in an adjusted position to orient the eccentric means mounted on the control shaft relative to the axis of the tangential cylinder, an eccentric sleeve mounted for rotation on each end of the control shaft, a bearing mounted on each sleeve for the rotation of the hollow cylinder, each eccentric sleeve being rotatable on the control shaft between two predetermined positions, one position relative to the intermediate eccentric means mounted on the control shaft to render the intermediate eccentric means operative to flex the shaft and another position to release the flexure and neutralize the intermediate eccentric means, and a two-position releasable locking means interconnecting each of the eccentric sleeves and the control shaft for locking the adjustable eccentric sleeves on the control shaft in one of said predetermined positions to render the intermediate eccentric means operative to flex the cylinder, said releasable locking means permitting quick release and adjustment of the eccentric sleeves for rotation on the control shaft from the one predetermined position to the other.

4,637,110

METHOD FOR MAKING A COMPOSITE CYLINDER BLOCK

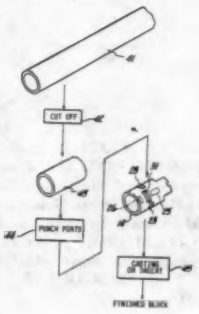
Hiroshi Yamagata, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 22, 1985, Ser. No. 704,535

Claims priority, application Japan, Feb. 24, 1984, 59-33903

Int. Cl.[4] B23P *15/00, 17/00*

U.S. Cl. 29—156.4 WL **2 Claims**



1. The method of making a composite cylinder block for an internal combustion engine or the like comprising forming a cylinder liner from a cylindrical pipe section, pre-forming by a punching operation at least one port opening in said cylinder liner, said punching operation being carried out from the outer diameter of the cylinder liner to its inner diameter for forming an inwardly tapered opening, and fixing said cylinder liner in a block of different material by casting the block of different material around the cylinder liner while the cylinder liner is held in place.

4,637,111

PROCESS OF MAKING HEAT EXCHANGERS

Stephen F. Pasternak, Palm Harbor, Fla., and Franz X. Wehrstein, Chicago, Ill., assignors to Peerless of America, Inc., Chicago, Ill.

Division of Ser. No. 386,950, Jun. 10, 1982, Pat. No. 4,554,970. This application Jun. 17, 1985, Ser. No. 745,204

Int. Cl.[4] B21D *53/02;* **B23P** *15/26;* **F28F** *1/20*

U.S. Cl. 29—157.3 A **8 Claims**

1. The method of making a heat transfer element comprising:

a. forming an elongated tubular member having a wall portion and a longitudinal center line therein,

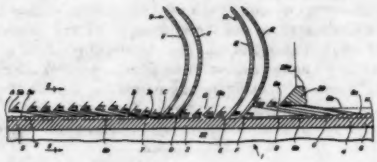
b. successively, from one end portion of said tubular member toward the other end portion thereof,

(1) making cuts into said wall portion with a cutter means to thereby afford elongated fins extending across said

tubular member in a direction transverse to the length thereof,

(2) turning said fins outwardly into outwardly projecting relation to said tubular member, and

c. predeterminedly severing with said cutter means certain of said fins from said wall prior to making the next succes-



sive cut into said wall to provide at least two groups of fins spaced from each other longitudinally along said wall portion with the spacing therebetween formed by the severed fins stubs having substantially a horizontal outer plane surface with signed to the longitudinal center line of said tubular member.

4,637,112

METHOD FOR SHAPING ALUMINUM WHEEL

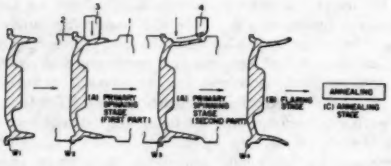
Akira Asari, Hyogo; Satoshi Matsumoto, Osaka; Shigeo Hattori, Kobe, and Takayoshi Dosai, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 27, 1986, Ser. No. 822,807

Claims priority, application Japan, Mar. 19, 1985, 60-56348

Int. Cl.⁴ B21K *1/32*

U.S. Cl. 29—159.01 **1 Claim**



1. A method for forming aluminum wheels from cylindrical forging aluminum blanks of substantially H-shape in section, comprising the steps of:

(A)

i supporting opposite rim portions of an aluminum work by spinning dies, and

ii subjecting said work to primary spinning including press-shaping by a thick-walled-work-stretching first spinning roller and

iii subjecting said work to preliminary spinning by a second spinning roller;

(B) flaring the inner end of said rim;

(C) annealing said work to remove work-hardening resulting from the flaring operation; and

(D) subjecting said work to secondary spinning including final spinning by said second spinning roller and corner R-finishing by a third spinning roller.

4,637,113

TOOL FOR REMOVING AND REAPPLYING RIVETS

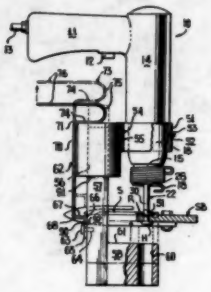
John Cook, Rte. 1, Trimble, Tenn. 38259

Continuation of Ser. No. 395,626, Jul. 6, 1982, Pat. No. 4,476,615. This application May 9, 1984, Ser. No. 608,451

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.⁴ B23P *11/00*

U.S. Cl. 29—243.54 **4 Claims**



1. A power tool adapted for use with power bits to remove old rivets and reapply new rivets relative to an associated riveted element comprising support means for underlying contactingly supporting an element adjacent an associated old rivet in alignment with a punch bit reciprocated by the power tool, means for removably securing said support means to the power tool, anvil means carried by said support means for underlyingly contactingly supporting a new rivet while a shank thereof is upset by a riveting bit reciprocated by the power tool, means for slidably connecting said support means relative to said securing means, said slidably connecting means includes a sleeve telescopically slidably receiving a rod, said support means being carried by said rod, said sleeve being defined by a portion of said removable securing means, means for preventing the inadvertent slidable disconnecting of said rod relative to said sleeve, said disconnecting preventing means including an elongated member connected at a first end thereof to said rod at an end of said rod adjacent said anvil, and said elongated member having a second end remote from said anvil in overlying relationship to an end of said sleeve remote from said anvil.

4,637,114

RIVETING APPARATUS

Jimmie C. Mathews, Sr., 717 Mountain Dr., Birmingham, Ala. 35206

Filed Jun. 21, 1985, Ser. No. 747,323

Int. Cl.⁴ B25B *27/00*

U.S. Cl. 29—243.54 **7 Claims**

1. Apparatus for fastening disc-like members together uniformly in spacing and compression with a plurality of compressive fasteners, comprising in combination:

(a) an upright frame including a top support member;

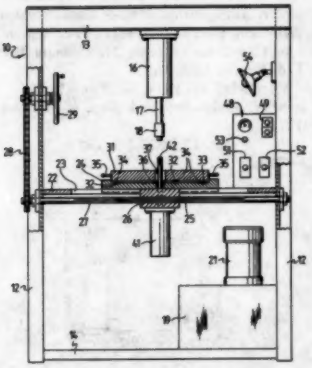
(b) an elongated horizontal threaded member mounted for rotation within said frame in spaced relation to said top support member;

(c) a carriage having a central vertical aperture mounted within said frame with said carriage engaging said threaded member such that rotation of said threaded member translates said carriage horizontally within said frame;

(d) a turntable having a central vertical aperture mounted atop said carriage with the apertures thereof vertically aligned;

(e) a hydraulic ram depending from said top support member

at a reference position above said carriage and turntable; and



(f) a pneumatically actuated retainer cooperatively mounted beneath said carriage and extending upwards through said apertures to engage and hold said disc-like members.

4,637,115

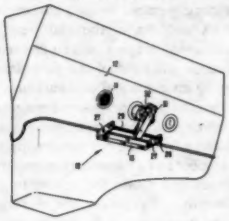
CORE PLUG DRIVER TOOL

William E. Hillock, R.R. #1, Box 285, Danville, Ind. 46122

Filed Dec. 9, 1985, Ser. No. 806,417

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—275 **7 Claims**



1. A tool for driving core plugs into the core plug holes of an engine block, comprising:

an arm support having a fastening means for fixedly fastening said arm support to said engine block;

an arm pivotally mounted at one end to said arm support and having a free end opposite the one end of said arm, said arm further including a force applying surface adjacent the free end of said arm, said plug driver positioned between said force applying surface and the one end of said arm, said arm support including a means for movably adjusting the position of said arm along the length of said arm support, said arm support further including a yoke having said fastening means thereon and a rod mounted at opposite ends thereof to said yoke, said arm being slidably received over and pivotally mounted to said rod; and

a plug driver pivotally connected to the free end of said arm at a location along said arm spaced apart from said one end, said plug driver having a cylindrical shaped head for driving a core plug into a desired one of the core plug holes in an engine block, whereby a mechanical advantage is provided in driving the core plug by application of force to said force applying surface.

4,637,116

METHOD FOR FASTENING A COVERING PART AT A FRAME PART

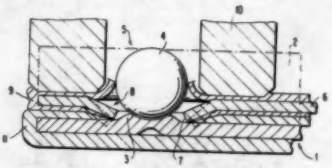
Jochen Pärisch, Herrenberg, and Werner Herlemann, Aidlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,061

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441349

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—441 R **2 Claims**



1. a method for fastening a cover part at a frame part with the aid of fastening means each having a ball head secured at one part and engaging from below at coordinated counter fastener means at the other part, comprising the steps of providing spherical segments formed out of the frame part with fastener means constructed as balls, mounting over the balls counter fastener means in the form of ring-shaped collar means angularly bent in the direction of the frame part and formed out of the cover part, and thereafter pressing flat each collar means by a predetermined amount under straightening thereof during a subsequent pressing operation in which the frame part serves as support surface.

4,637,117

METHOD FOR DEEP DRAWING THIN METAL STOCK INTO CONTAINERS AND THEREAFTER COATING EACH CONTAINER

Richard J. Karas, Addison, and John LaRosa, Carpentersville, both of Ill., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 251,232, Apr. 6, 1981, abandoned, which is a continuation of Ser. No. 016,371, Mar. 1, 1979, abandoned. This application Oct. 4, 1983, Ser. No. 548,812

Int. Cl.[4] B23P *17/00, 25/00*; B21B *45/02*

U.S. Cl. 29—527.4 **15 Claims**

1. A method of deep drawing thin metal stock into containers and post-coating said containers including the steps of:

(a) providing a lubricant composition that consists essentially of a combination of (1) air drying type hydroxylated alkyl silicone resin mixed in an aromatic hydrocarbon solvent and (2) peanut oil or lanolin mixed in an aliphatic hydrocarbon solvent;

(b) applying said composition to an uncoated or precoated metal substrate in an amount sufficient to form a uniform dispersion of such composition across the substrate surfaces;

(c) permitting said composition to dry to form a lubricant film over the surfaces of said metal substrate;

(d) progressively forming by deep drawing the lubricant film covered substrate into a deeply drawn container having a depth which is greater than its width;

(e) applying a post-coating synthetic resin composition to said deeply drawn container without removing residual lubricant film, and

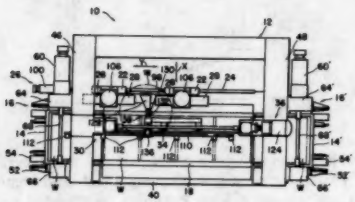
(f) subjecting said post-coated deeply drawn container to elevated temperature to form a bonded film on the surfaces of said container.

4,637,118

MACHINE TOOL FOR DRILLING PRINTED CIRCUIT BOARDS

Kiyoshi Sugiyama, Susono, and Tomio Furuhashi, Numazu, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,614
Claims priority, application Japan, Feb. 25, 1985, 60-36148
Int. Cl.[4] B23Q 7/06
U.S. Cl. 29—563 15 Claims



1. A machine tool for working on flat workpieces such as printed circuit boards, comprising:

(a) frame means;

(b) a work supply magazine mounted to the frame means on one side thereof for holding a stack of flat workpieces to be worked upon;

(c) a work recovery magazine mounted to the frame means on the other side thereof for receiving the workpieces that have been worked upon;

(d) a table mounted to the frame means intermediate the work supply magazine and the work recovery magazine;

(e) saddle means mounted to the frame means and constrained to linear travel relative to the same along a predetermined path extending between the work supply magazine and the work recovery magazine;

(f) saddle drive means for controllably moving the saddle means along the predetermined path;

(g) toolhead means mounted to the saddle means and disposed over the table for working on the workpieces on the table;

(h) a carriage disposed over the table and constrained to linear travel relative to the frame means in a direction parallel to the predetermined path of the saddle means;

(i) work transfer means mounted to the carriage for vertical displacement into and out of work transfer engagement with the workpieces in the work supply magazine and on the table; and

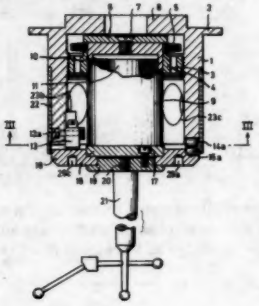
(j) drive coupling means for connecting and disconnecting the saddle means and the carriage, the carriage when connected to the saddle means being driven by the saddle drive means for enabling the work transfer means to transfer the successive workpieces from the work supply magazine to the table and thence, upon completion of the required working on the workpieces by the toolhead means, to the work recovery magazine, the carriage when disconnected from the saddle means allowing the toolhead means to work on the workpieces on the table by being driven by the saddle drive means independently of the carriage and the work transfer means.

4,637,119

CHUCKING DEVICE FOR INTERCHANGEABLE HOLDING OF PROBE PINS IN A COORDINATE-MEASURING INSTRUMENT

Horst Schneider, Königsbronn; Rainer Zeeh, Heidenheim, and Hans J. Neumann, Oberkochen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed May 31, 1984, Ser. No. 615,837
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1983, 3320127
Int. Cl.[4] B23Q 3/155
U.S. Cl. 29—568 10 Claims



1. A clamping device for the interchangeable attachment of a work-contacting probe pin or probe-pin combination to the probe head of a coordinate-measuring instrument, wherein the probe pin or probe-pin combination has a connecting member of magnetic flux-conducting material, said clamping device comprising a reference support having means engageable with an applied connecting member in such manner as to unequivocally determine its position in the clamping device on the probe head, a permanent magnet and an electromagnet whose field is superposed on the field of the permanent magnet, the electromagnet being an electrical coil surrounding the permanent magnet and utilizing the permanent magnet as the central core of the electromagnet, the permanent magnet being movable toward and away from the reference support and being so positioned with respect to a connecting member applied to said support as to attract and retain the connecting member in its unequivocally determined position; the electromagnet, when excited in polarized opposition to the permanent magnet, effectively neutralizing the attraction of the permanent magnet to the applied connecting member; and spring means reacting between the support and the permanent magnet and urging the magnet in the direction away from the support and with a force which is less than the force of permanent-magnet attraction to an applied connecting member.

4,637,120

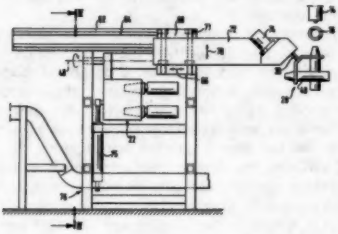
DEVICE FOR CHANGING OF TOOLS OR THE LIKE INTO THE WORK SPINDLE OF A MACHINE TOOL

Michael Geiger, Starnberg, Fed. Rep. of Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 708,997
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408734
Int. Cl.[4] B23Q 3/157
U.S. Cl. 29—568 11 Claims

1. In a device for changing of tools in a work spindle of a machine tool, comprising a changing arm having a shaft and two arms which are aligned substantially radially with respect to an axis of rotation of said shaft, whereby said axis of rotation of said shaft is aligned at an angle of 45° with respect to an axis

of said work spindle, each arm having a gripping end provided with gripping devices, and means for adjustably moving said changing arm relative to said work spindle in a spindle axis direction, the improvement comprising wherein said gripping ends of said arms are offset laterally with respect to one another with reference to a reference plane which extends through said axis of rotation, so that axes of said tools held by



said gripping ends lie in spaced apart planes on opposite sides of and parallel to a plane containing said axis of rotation and do not, therefore, intersect, and wherein said gripping devices each include a support means for orienting said axes of said tools which are to be inserted into said work spindle so that said axes of said tools, on a side of said changing arm having said shaft thereon, extend away from said axis of rotation of said shaft.

4,637,121

METHOD OF OPERATING INDUSTRIAL ROBOTS, AND INDUSTRIAL ROBOT FOR CARRYING OUT THE METHOD

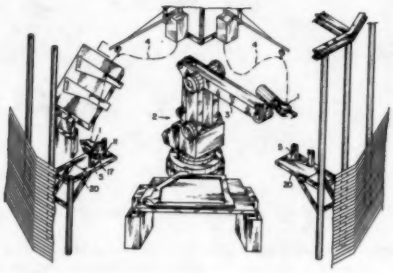
Johannes Wortmann, Georgsmarienhütte, Fed. Rep. of Germany, assignor to Wilhelm Karmann GmbH, Osnabruck, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,046

Claims priority, application European Pat. Off., Jan. 26, 1984, 84100810.5

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 **6 Claims**



1. An industrial robot supporting a tool thereof, comprising: an arm to which a first tool comprising a connector plate, having clamping blocks, may be releasably connected, said arm including, upon performing given work, means for causing the robot to release the tool, the first tool being thereafter separated from the robot arm, while leaving the first tool provided for such work connected to one or more associated supply lines, and for connecting a second tool including one or more associated supply lines to the robot arm and thereafter causing the robot arm to move the second tool to a desired location, said means comprising a connector plate having clamping jaws adapted to be connected transversely of the connector plate with the clamping blocks, the connector plate of each tool on the one hand, and the connector plate of the arm on the other hand, comprising a pair of guide holes and a pair of mating guide studs, respectively, with the studs in an approaching phase entering the holes to effect positive-engagement final positioning, whereupon the operations for which the second tool is provided are carried out.

4,637,122

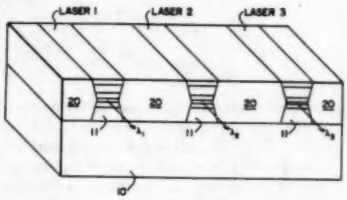
INTEGRATED QUANTUM WELL LASERS FOR WAVELENGTH DIVISION MULTIPLEXING

James K. Carney, Eden Prairie, and Robert M. Kolbas, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 533,187, Sep. 19, 1983, Pat. No. 4,577,321. This application Jul. 29, 1985, Ser. No. 759,798

Int. Cl.[4] H01L *21/18, 21/20*

U.S. Cl. 29—569 L **2 Claims**



1. A process of fabricating an integrated quantum well laser structure which has a plurality of quantum well lasers for providing a plurality of light beams each having a different wavelength, the process steps comprising:

(a) providing a gallium arsenide substrate having a planar surface and patterning the substrate so that a spatial variation in epitaxial growth rates will occur;

(b) growing over said surface a first cladding layer;

(c) growing over said cladding layer an active sandwich layer which includes growing alternating thin layers of $Al_xGa_{1-x}As$ and $Al_yGa_{1-y}As$ followed by a final $Al_xGa_{1-x}As$ layer, said active sandwich layer having a controlled variation in thickness over the surface of said cladded substrate wherein said thickness is different from one to the next of said plurality of quantum well lasers;

(d) growing a second cladding layer over said active sandwich layer;

(e) growing a gallium arsenide layer over said second cladding layer;

(f) locating the position of the individual multiple lasers in the structure and etching away the unwanted layer material between the individual lasers down to the substrate to create voids between the individual lasers; and,

(g) refilling the voids by growing further cladding material into the voids to thereby provide isolation between the individual quantum well lasers.

4,637,123

METHOD OF STANDARDIZING AND STABILIZING SEMICONDUCTOR WAFERS

Victor Cazcarra, Mennecy, and Jocelyne LeRoueille, Juvisy-/Orge, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,329

Claims priority, application European Pat. Off., Jun. 20, 1984, 84430020.2

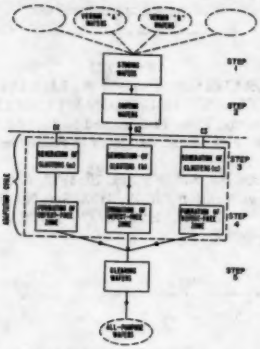
Int. Cl.[4] H01L *21/02, 21/477*

U.S. Cl. 29—569 R **20 Claims**

1. A method of standardizing and stabilizing semiconductor

wafers supplied by a plurality of vendors for use in unipolar and bipolar device manufacture, said method comprising:

(a) sorting said wafers into a plurality of classes in accordance with the oxygen precipitation rate of said wafers and retaining all of said wafers; and



(b) generating in each of said wafers (1) clusters of a concentration corresponding to a predetermined cluster concentration range and (2) a defect-free zone of a thickness corresponding to a predetermined defect-free zone thickness by subjecting the wafers to a thermal adaptation cycle, said thermal adaptation cycle being different for different classes of wafers.

4,637,124

PROCESS FOR FABRICATING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

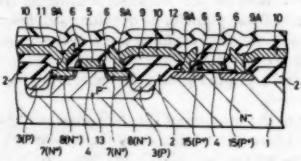
Kousuke Okuyama, Tachikawa; Norio Suzuki, Koganei; Satoshi Meguro, Tokyo, and Kouichi Nagasawa, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,760

Claims priority, application Japan, Mar. 16, 1984, 59-49042

Int. Cl.⁴ H01L *21/38*

U.S. Cl. 29—571 **16 Claims**



1. A process for fabricating a semiconductor integrated circuit device, comprising the steps of:

(a) providing a semiconductor substrate, said substrate having a well region in a surface region of the substrate, leaving a portion of the semiconductor substrate surface region in which the well region is not formed, the well region being of conductivity type opposite that of said portion of the semiconductor substrate surface region, said substrate having gate oxide films, formed on said well region and on said portion, where semiconductor elements are to be formed;

(b) forming gate electrodes for metal insulator semiconductor field effect transistors both on the gate oxide films on the well region and on said portion of the semiconductor substrate surface region, each gate electrode having opposed sides and adapted to have a channel region in a surface region of the respective well region and semiconductor substrate beneath each gate electrode;

(c) forming side wall spacers at each side of each of the gate electrodes;

(d) introducing a first impurity, of conductivity type the same as that of the semiconductor substrate, into the well region without introduction into said portion of the semiconductor substrate surface region, using the gate electrode on the well region and its respective side wall spacers as a mask;

(e) introducing a second impurity, of conductivity type the same as that of said first impurity, into the well region without introduction into said portion of the semiconductor substrate surface region, using the gate electrode on the well region and its respective side wall spacers as a mask, the second impurity having a lower diffusion speed in the well region than the first impurity;

(f) diffusing the first and second impurities into the well region, to form first and second semiconductor regions, respectively. therein, whereby, due to the different diffusion speeds in the well region, the first semiconductor region covers the second semiconductor region; and

(g) introducing a third impurity, of conductivity type the same as the well region, into said portion of the semiconductor substrate surface region, using the gate electrode on said portion and its respective side wall spacers as masks, so as to form third semiconductor regions, whereby complementary metal insulator semiconductor field effect transistor can be formed in the semiconductor substrate, and whereby the side wall spacers suppress the first, second and third semiconductor regions from extending underneath the gate electrodes.

4,637,125

METHOD FOR MAKING A SEMICONDUCTOR INTEGRATED DEVICE INCLUDING BIPOLAR TRANSISTOR AND CMOS TRANSISTOR

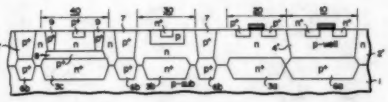
Hiroshi Iwasaki, Chigasaki, and Shintaro Ito, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 652,087, Sep. 19, 1984, abandoned. This application Apr. 3, 1986, Ser. No. 847,150

Claims priority, application Japan, Sep. 22, 1983, 58-175363; Sep. 28, 1983, 58-179558

Int. Cl.⁴ H01L *21/38*

U.S. Cl. 29—571 **2 Claims**



1. A method for manufacturing a semiconductor integrated device comprising the steps of:

selectively doping an impurity of a second conductivity type on a main surface of a semiconductor substrate of a first conductivity type, so as to form first and second high concentration buried regions of the second conductivity type for bipolar transistors and a third high concentration buried region of the second conductivity type for a MOS transistor;

selectively doping an impurity of the first conductivity type having a larger diffusion coefficient than that of said impurity of second conductivity type in said semiconductor substrate, so as to form fourth high concentration buried regions of the first conductivity type so as to respectively surround said first and second high concentration buried regions for the bipolar transistors and a fifth high concentration buried region of the first conductivity type for the MOS transistor, and simultaneously doping

said impurity of the first conductivity type on said first high concentration buried regions;

epitaxially growing a semiconductor layer of the second conductivity type on a surface of said semiconductor substrate in which high concentration buried regions are formed, auto-doping said impurity of the first conductivity type which is doped in said first high concentration buried regions, and forming a sixth high concentration buried region of the first conductivity type to be in contact with a surface of said first high concentration buried region;

selectively diffusing an impurity of the first conductivity type from a main surface of said semiconductor layer so as to form a first well region of the first conductivity type to reach said fifth high concentration buried region;

selectively performing high-concentration diffusion of an impurity of the first conductivity type from the main surface of said semiconductor layer or selectively converting said semiconductor layer into an insulating layer, so as to form a first electrical isolation region reaching said fourth high concentration buried regions which are formed so as to respectively surround said first and second high concentration buried regions;

selectively performing high-concentration diffusion of an impurity of the first conductivity type from the main surface of said semiconductor layer, or selectively converting said semiconductor layer into an insulating layer, so as to form a second electrical isolation region reaching said sixth high concentration buried regions, the second electrical isolation region enclosing a part of said semiconductor layer of the second conductivity type; and

forming two vertical bipolar transistors and MOS transistors of first and second conductivity type channels; said bipolar transistors being formed in the semiconductor region of the second conductivity type surrounded by said first electrical isolation region, one, which includes said semiconductor region as the collector region, in that part of said semiconductor region in which said sixth high concentration buried region is not formed, and the other, which includes said sixth high concentration buried region as the collector, in the other part of said semiconductor region; the MOS transistor of the second conductivity type channel being formed in said first well region of the first conductivity type; and the MOS transistor of the first conductivity type channel being formed on the semiconductor region of the second conductivity type positioned above said third high concentration buried region.

4,637,126

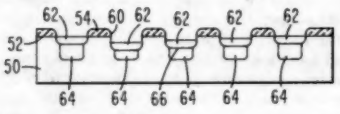
METHOD FOR MAKING AN AVALANCHE PHOTODIODE

Alexander W. Lightstone, Quebec, Canada, assignor to RCA, Inc., Ste-Anne-de-Bellevue, Canada

Filed Aug. 30, 1985, Ser. No. 771,066

Int. Cl.[4] H01L *21/302*

U.S. Cl. 29—572 **7 Claims**



1. A method of making an avalanche photodiode comprising the steps of:

embedding first type conductivity modifiers into a semiconductor body have a first conductivity type through a portion of a surface thereof wherein the concentration of first type conductivity modifiers is greater than the concentration of first type conductivity modifiers originally in said body;

measuring the concentration of said embedded first type conductivity modifiers;

removing material from said portion of said surface corresponding to the variation in the measured local concentration of said embedded first type conductivity modifiers; and

embedding second type conductivity modifiers having the opposite conductivity type to said first type conductivity modifiers into said body through said portion of said first surface in a concentration sufficient to convert a region of said body adjacent to said portion of said surface to said second conductivity type.

4,637,127

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

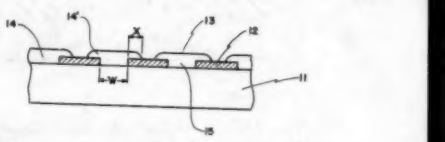
Yukinori Kurogi; Nobuhiro Endo, and Kohetsu Tanno, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Japan

Filed Jul. 6, 1982, Ser. No. 395,110

Claims priority, application Japan, Jul. 7, 1981, 56-105882; Jul. 7, 1981, 56-105883; Jul. 7, 1981, 56-105884; Jul. 7, 1981, 56-105885; Jul. 7, 1981, 56-105886; Jul. 7, 1981, 56-105888; Sep. 29, 1981, 56-154376; Sep. 29, 1981, 56-154377; Sep. 29, 1981, 56-154378; Oct. 1, 1981, 56-156683; Oct. 1, 1981, 56-156684

Int. Cl.[4] H01L *21/205, 21/76*

U.S. Cl. 29—576 E **7 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of preparing a single crystal silicon substrate having a major surface with an insulating film formed thereon, at least one aperture selectively formed in said film, said insulating film including a silicon dioxide film and a silicon nitride film deposited on the side surface of said aperture formed in said silicon dioxide film, setting said single crystal silicon substrate within a chamber, and growing a silicon monocrystalline layer extending from the portion of said single crystal silicon substrate which is within said aperture, said grown layer extending onto said insulating film, said layer being grown by making dichlorosilane, hydrogen chloride, and a carrier gas flow into said chamber and by reacting them under a reduced gas pressure.

4,637,128

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Yoshihisa Mizutani, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Apr. 23, 1985, Ser. No. 726,399

Claims priority, application Japan, Jun. 18, 1984, 59-124687

Int. Cl.[4] H01L *21/308, 29/78*

U.S. Cl. 29—576 B **12 Claims**

1. A method of producing a semiconductor device, comprising the steps of:

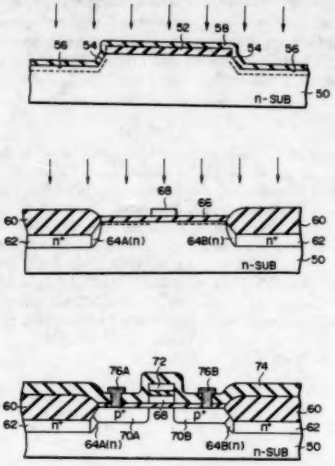
(1) forming a film pattern on a semiconductor substrate of a first conductivity type to define a masked surface as an element region;

(2) anisotropically etching the substrate with said film pattern as used as a mask to form a recess having a flat bottom and inclined side in a peripheral region surrounding said element region, said inclined side being located between the flat bottom and the masked surface of said element region and being disposed at a predetermined angle relative to the flat bottom;

(3) forming a covering layer on said flat bottom and inclined side, said covering layer having a uniform thickness;

(4) implanting impurity ions of the first conductivity type into the substrate through the covering layer in a direction substantially perpendicular to said flat bottom;

(5) forming a field insulation layer on said flat bottom and inclined side and diffusing the implanted impurity ions in



the substrate to form first and second regions of the first conductivity type immediately below the respective flat bottom and inclined side, said first and second regions having different impurity concentrations as determined by said predetermined angle; and

(6) forming, in said element region, a third region of a second conductivity type in contact with said second region.

4,637,129

SELECTIVE AREA III-V GROWTH AND LIFT-OFF USING TUNGSTEN PATTERNING

Gustav E. Derkits, Jr., New Providence, and James P. Harbison, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 30, 1984, Ser. No. 635,902

Int. Cl.[4] H01L *21/20, 21/302*

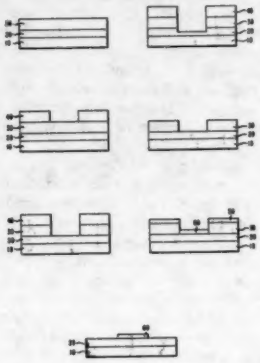
U.S. Cl. 29—578 **13 Claims**

1. A method of semiconductor device fabrication comprising the steps of:

growing a Group III-V semiconductor structure;

forming a metal layer on the surface of said Group III-V semiconductor structure, said growing and forming steps performed in the same vacuum system;

pattern delineating said metal layer to expose a portion of the surface of said semiconductor structure;



modifying the surface of said structure, said modifying step growing at least one Group III-V epitaxial layer; and

removing said patterned metal layer.

4,637,130

METHOD FOR MANUFACTURING A PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE AND A LEAD FRAME THEREFOR

Hiroyuki Fujii, Osaka; Kenichi Tateno, Shiga, and Mikio Nishikawa, Kyoto, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Division of Ser. No. 352,119, Feb. 25, 1982, Pat. No. 4,507,675.

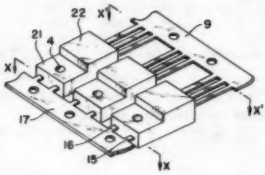
This application Jan. 17, 1985, Ser. No. 692,385

Claims priority, application Japan, Mar. 5, 1981, 56-32229

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.[4] H01L *21/56*

U.S. Cl. 29—588 **5 Claims**



1. A method for manufacturing a plastic encapsulated semiconductor device comprising the steps of clamping at least external leads and strips of a semiconductor device assembly formed using a lead frame which has a first connecting band connected to said external leads extending from one side of a substrate support further used as a heat sink and a second connecting band connected to said strips extending from the other side of said substrate support, clamping at least said external leads and said strips by upper and lower molds so that said substrate support may float in a cavity formed by said upper and lower molds, injecting a plastic into the cavity while parts of said strips are disposed in said cavity, and cutting parts of said strips which extend outside a plastic encapsulating housing and cutting a connecting portion between said external leads and said first connecting band.

4,637,131

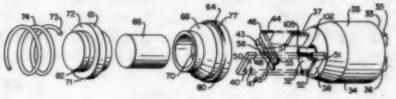
DIFFERENTIAL PRESSURE OPERATED ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Rolf H. Ochsner, Trumbull, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 536,305, Sep. 27, 1983, Pat. No. 4,520,245. This application Mar. 18, 1985, Ser. No. 713,186

Int. Cl.⁴ H01H *11/00*

U.S. Cl. 29—622 **8 Claims**



1. In a method of making a differential pressure operated electrical switch construction having a housing means carrying a pair of rigid substantially straight parallel terminals and an electrical switch means for electrically interconnecting said terminals together when said switch means is in one operating condition thereof and for electrically disconnecting said terminals from each other when said switch means is in another operating condition thereof, said method comprising the steps of disposing actuator means in said housing means so as to be responsive to differential pressures acting across the same, and operatively associating said actuator means with said switch means to place said switch means in said one condition thereof when having a certain differential pressure acting across the same and to place said switch means in said other condition thereof when having another certain differential pressure acting across the same, the improvement comprising the steps of forming a substantially rectangular opening that passes transversely and completely through an end of one of said terminals and that defines a substantially straight interior edge means of said one terminal, forming said switch means to comprise a movable switch blade having an L-shape defined by two legs thereof one of which is carried by the other of said terminals, disposing the other leg of said switch blade in said opening for engaging against said edge means and thereby place said switch means in said one condition thereof and for being out of engagement with said edge means and thereby place said switch means in said other condition thereof, and causing said other leg to be disposed at an angle other than a right angle relative to said one leg thereof when said other leg is engaging against said edge means.

4,637,132

APPARATUS FOR ASSEMBLING HEAT EXCHANGER CORE

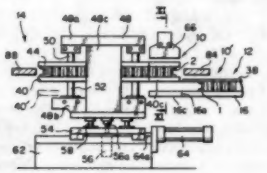
Takatoshi Iwase, Anjo, and Akira Nakagawa, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 9, 1985, Ser. No. 753,622

Claims priority, application Japan, Jul. 10, 1984, 59-141372

Int. Cl.⁴ B23P *15/26*

U.S. Cl. 29—726 **14 Claims**



1. An apparatus for assembling a heat exchanger core assembly comprised of a pair of opposed inserts and a plurality of tubes and corrugated fins arranged in an alternate manner between the inserts, said apparatus comprising:

first guide rail means having a front end and a rear end;

second guide rail means having a front end and a rear end, the second guide rail means being arranged in such a manner that the rear end of the second guide rail means faces the front end of the first guide rail means so as to define a substantially continuous guide surface therealong;

a pair of chain attachment means extending between the rear end of the first guide rail means and the front end of the second guide rail means on either side of the guide rail means for movement in a direction from the rear end of the first guide rail means to the front end of the second guide rail means;

loading stations located between the rear end and the front end of the first guide rail means above the chain attachment means for loading the inserts, tubes and corrugated fins, respectively, on the first guide rail means, with the ends of the inserts and tubes engaged with the chain attachment means;

means for elevating the second guide rail means between a first position in which the second guide rail means is in alignment with the first guide rail means and a second position elevated from the first position in which the inserts and the tubes are disengaged from the chain attachment means; and

means for compressively clamping the core assembly on the second guide rail means when said second guide rail means is in the second position and for removing the core assembly from the second guide rail means.

4,637,133

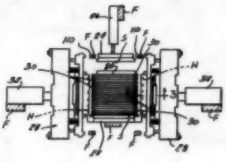
APPARATUS FOR ASSEMBLING RADIATOR COMPONENTS

Herbert J. Freeman, Riverview, Mich., assignor to Progressive Tool & Industries Company, Southfield, Mich.

Filed Jul. 30, 1985, Ser. No. 760,403

Int. Cl.⁴ B23P *15/26*; B21D *39/00*

U.S. Cl. 29—727 **10 Claims**



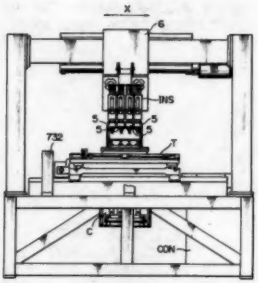
1. An assembly apparatus for locating and fixing one end of a tube to a header within a tube receiving opening in the header, said apparatus comprising a frame, a tool carrier mounted on said frame for forward and rearward movement between spaced front and rear end limits, an expansion tool fixedly mounted on and projecting forwardly from said tool carrier for movement with said tool carrier to be located in a retracted position when said tool carrier is at its rear end limit and to be located at an extended position when said tool carrier is at said front end limit, said tool being operable when driven into the end of a tube to peripherally expand the tube end, a header carrier, means mounting said header carrier on said tool

carrier for forward and rearward movement relative to said tool carrier in front of said tool carrier, spring means engaged between said tool carrier and said header carrier biasing said header carrier forwardly from said tool carrier to a selected end limit of forward movement relative to said tool carrier, said header carrier having a passage therethrough accommodating free movement of said tool through said header carrier upon movement of said header carrier relative to said tool carrier, header mounting means for detachably mounting a header on the front of said header carrier with the tube receiving opening in the header aligned with said tool, means operable when said tool carrier is at its rear end limit for locating a tube on said frame with one end of said tube aligned with said tube receiving opening and said tool and spaced forwardly from said header and rearwardly of the extended position of said tool, drive means for driving said tool carrier forwardly from its rear end limit to advance said header and said tool toward said tube, and stop means for stopping forward movement of said header carrier when said one end of said tube is located within the tube receiving opening in said header while accommodating continued forward movement of said tool carrier to said front end limit.

4,637,134
APPARATUS FOR AUTOMATICALLY INSERTING ELECTRONIC PART

Tomoya Tomita, Narita; Sotozi Hiramoto; Takesi Okubo, both of Chiba; Kuniyuki Matsuo, Narashino; Hiromoto Ashihara, Funabashi; Mitsuo Nakamura; Tsutomu Takahashi, both of Sakura; Motoaki Fujino, Narashino, and Kenji Hosaka, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 702,265
Claims priority, application Japan, Mar. 9, 1984, 59-44015
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—741 **9 Claims**



1. An apparatus for automatically inserting electronic parts comprising:

a plurality of electronic parts supplying means, each fixedly disposed at a respective predetermined position to store a multiplicity of electronic parts and to supply said electronic parts successively;

a corresponding plurality of feeding means respectively associated with said supplying means for feeding said electronic parts, after they have been respectively supplied successively from said electronic part supplying means, to a corresponding plurality of fixed predetermined supply positioning ends;

an insertion unit including a corresponding plurality of hand means, each for respectively grasping an electronic part at a respective one of said supply positioning ends to transfer the grasped electronic part to a respective predetermined specific fixed insertion position and inserting the leads of the grasped electronic part into a respective receiving hole of a printed board;

an X-Y table means for holding the printed board into which said electronic part is inserted and moving said printed board to locate said printed board at a desired position on the X-Y plane in accordance with an insertion position instruction;

means for providing an insertion position instruction different for each of said electronic parts;

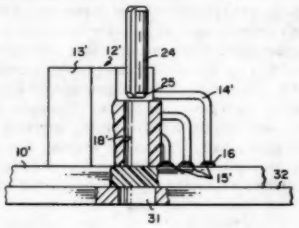
a clinching means on the opposite side of said table from said insertion unit, to approach the printed board from a fixed original position to support the printed board and then clinch the leads of the electronic part inserted into the printed board; and

control means for controlling a predetermined operation of each of said means, said control means controlling each of said hands to operate separately from each other during the period of inserting the electronic part, and operate simultaneously during other periods including the grasping and transferring.

4,637,135
METHOD FOR MOUNTING A CONNECTOR TO A SUBSTRATE

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 1, 1985, Ser. No. 718,769
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—832 **5 Claims**



1. A method of mounting a connector to a substrate comprising:

placing a connector having electrical contacts and at least one mounting hole therein onto the substrate so as to align said electrical contacts with respective conductive paths on said substrate;

moving a pin along a longitudinal axis of said mounting hole; and

driving a leading end of the pin through the substrate causing the pin to be frictionally engaged with the substrate as well as an inner wall of the mounting hole thereby securing the connector to the substrate.

4,637,136
METHOD AND APPARATUS FOR WIRING SYSTEM INSTALLATION

Anthony J. Rynk, East Brunswick, and David J. DeCarlo, Toms River, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 31, 1984, Ser. No. 646,595
Int. Cl.[4] H01R *43/00;* **G01B** *3/30;* **B23Q** *3/00;* **H05K** *1/00*
U.S. Cl. 29—872 **24 Claims**

1. A connection zone location and selection device for application to first and second flat multiconductor cables secured to one another in overlapped relation to thereby define a a matrix of connection zones each having in registry therewith a distinct pair of conductors of said cables, said device comprising: a body member adapted for movement with respect to said cables means; on said body member for making perforations through said cables; and means for registering said body member with a preselected location on said cables or with perforations made by such perforating means for disposing said perfo-

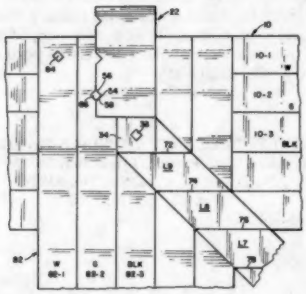
rating means in registry with selected ones of said connection zones, said perforation means including a punch fixedly secured to said body member for movement therewith, said punch being operable selectively for making a perforation of predetermined configuration through said cables upon operation thereof and wherein such registration means includes a first index for registry with respective first and second margins of said cables, a second index fixedly spaced from said first index, a third index fixedly spaced from said second index and a fourth index aligned with and fixedly spaced from said second and third index each index having configuration in common with said predetermined configuration for registry with perforations made by said punch.

10. A kit of parts for making an updercarpet power installation, comprising:

(a) flat multiconductor cable having elongate conductors on centerlines spaced in electrical insulation laterally by measure D;

(b) electrical connectors adapted for insulation-piercing connection of conductors of plural such cables in overlapped arrangment; and

(c) a connection location and selection device for application to first and second such flat multiconductor cables secured to one another in overlapped relation to thereby define a matrix of connection zones each having in registry therewith a distinct pair of conductors of said cables, said device being adapted for movement with respect to said



cables and including means thereon for making perforations through said cables and means for registering said device with a preselected location on said cables or with perforations made by such perforating means for disposing said perforating means in registry with selected ones of said connection zones comprising less than all of said connection zones, each such registration zone is a square of said length D1 and diagonal length D2, said device including a plate member 5 having a perforating aperture therethrough, said plate member further including a first index for registry with respective first and second margins of said cables for placement of said perforating aperture in registry with an origin connection zone and a second index having configuration in common with said perforating aperture and space therefrom by length D2.

20. In a method for making a power installation with flat cables having plural conductors in electrical insulation, the steps of:

(a) assembling a first such cable in overlapping relation to a second such cable;

(b) supporting a punch and plural locator indices in mutually fixed relation;

(c) registering a first such locator index with a preselected location on such cable assembly;

(d) operating said punch to make a first perforation through said cable assembly;

(e) registering a second such locator index with said first perforation; and

(f) operating said punch to make a second perforation through said cable assembly.

4,637,137

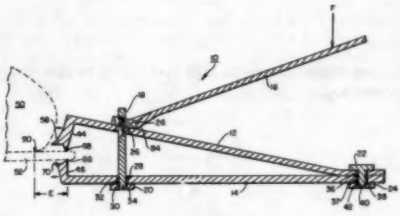
NAIL CLIPPER

Abbas Husain, 5 West Chestnut Ave., Merchantville, N.J. 08109

Filed Jul. 17, 1985, Ser. No. 755,913

Int. Cl.[4] A45D *29/02*

U.S. Cl. 30—28 **5 Claims**



1. In a clipper for a nail comprising a combination of a pair of cooperative jaws having a normal tendency to separate, a means for connecting said jaws, said means being located in a pivotal relation with said jaws, an operating member cooperating with said means, a means on said operating member projecting therefrom for proximating said jaws when said operating member is operated in one direction, said pair further comprising an upper jaw and a lower jaw, said upper jaw having an upper sharpened edge, said lower jaw having a lower sharpened edge, said upper edge and said lower edge being adapted to engage each other, said upper and lower edges each having a concave curvature projection upon a horizontal plane and each edge being adapted to substantially conform to a curvature of one end of a human finger in plan view, said upper edge further having a concave curvature projection upon a vertical plane, said lower edge further having a convex curvature projection upon a vertical plane, the improvement comprising:

flange member integrally connected to the upper jaw above said upper edge, said flange member tapering orthogonally away from said edge;

means for supporting a nail located adjacent said lower edge and integrally connected to said lower edge; and,

fang-like projections located at each end of said upper jaw in a continuous curvature of said upper cutting edge, said lower cutting surface being adapted to register and mate with said fang-like projections.

4,637,138

FOODSTUFF SLICER

Richard Pichè, 215 Saint-Lambert St., Valleyfield, Canada (J6T 1V1)

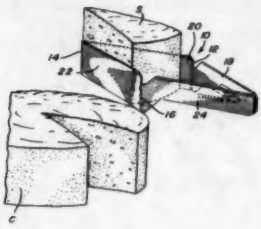
Filed Feb. 18, 1986, Ser. No. 830,060

Int. Cl.[4] A21C *15/04*

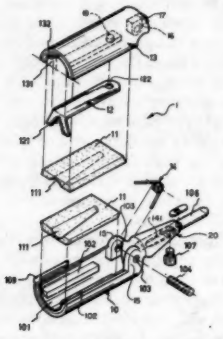
U.S. Cl. 30—114 **7 Claims**

1. A foodstuff slicer and server comprising a pair of cutting blades, a first hinge means hinging together one end of said blades, said blades normally diverging from said first hinge means to a predetermined maximum included angle of less than 90°, a pair of handles, second hinge means hinging one end of each handle to the opposite end of said blades respectively,

said handles converging from said second hinge means, third hinge means hinging together the opposite ends of said handles, and biasing means to urge said blades to said maximum included angle.

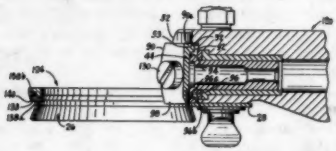


4,637,139
AMPOULE CUTTER
Fu Chen, No. 3, Alley 81, Lane 10, Sec. 2, Chang Ping Road, Taichung, Taiwan
Filed Dec. 7, 1984, Ser. No. 679,507
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—164.9 **8 Claims**



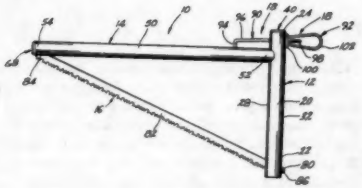
1. An ampoule cutter, comprising a pair of complementary longitudinally elongated shells having an open position and a closed position, each of the shells having a forward portion and a rearward portion, means for pivotably connecting the respective rearward portions of the shells together about a transverse axis, resilient means constantly urging the shells towards their open position, manually-releasable latching means for retaining the shells in their closed position against the force of the resilient means, whereby the shells will open when the latching means is released to allow an ampoule tip to be inserted between the shells, and whereby the shells then may be closed around the ampoule tip, and blade means within the shells for engaging the neck of the ampoule in the closed position of the shells, the blade means including a first elongated substantially-flat portion carried within one of the shells parallel to the longitudinal axis thereof and a second integral blade portion formed substantially at right angles to said first portion and extending toward the other of the shells, the arrangement being such that the ampoule may be rotated to engage the blade means and then snapped off.

4,637,140
BONING AND TRIMMING KNIFE
Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio
Continuation-in-part of Ser. No. 330,553, Dec. 14, 1981, Pat. No. 4,509,261. This application Jan. 31, 1985, Ser. No. 696,456
Int. Cl.[4] A22C *17/04, 17/12*
U.S. Cl. 30—276 **27 Claims**



1. For use in a hand knife of the type having a rotary ring blade for cutting meat and other suitable products, a ring blade housing having an axially elongated peripherally continuous portion adapted to be secured to a handle, to cover a blade-driving pinion in the handle, and to guide a continuous ring blade rotatable in the housing, said housing having two axial ends and an outer periphery, a circular recess that opens toward one axial end of the housing, spaced inwardly of the outer periphery, said recess having two radially spaced concentric side wall surfaces one of which is a surface of revolution that forms the recess wider at the opening than interiorly thereof, and said housing having two peripherally spaced axially extending slots in the elongated portion opening through the other axial end.

4,637,141
MULTI-PURPOSE COLLAPSIBLE HAND SAW
Thomas P. Allen, 8211 Purdue, Tyler, Tex. 75703
Filed Feb. 18, 1986, Ser. No. 830,531
Int. Cl.[4] B27B *21/02*
U.S. Cl. 30—512 **10 Claims**



1. A multi-purpose saw selectively positionable in one of an assembled working mode and a storage mode, said saw comprising:

a hollow handle having opposing first and second ends, the handle further characterized as having a first blade slot formed in the first end on one side thereof and a second blade slot formed in the first end on the opposing side thereof, said first and second blade slots longitudinally aligned with the second blade slot having a length less than the first blade slot, said handle further having a plurality of apertures disposed near the second end thereof, a pair of said apertures being spatially disposed in axial alignment on opposing sides of the handle and in substantial longitudinal alignment with the first and second blade slots, a third of said apertures being disposed on one side of the handle in substantial longitudinal alignment with the first blade slot;

a hollow back bar having opposing first and second ends, and upper and lower sides, the first end being configured with a concave groove for mating abuttment with a por-

tion of the handle when the saw is in the assembled working mode, the back bar partially receivable in the hollow of the handle in the storage mode of the saw, said back bar further characterized as having a back bar blade slot formed in the lower side of the back bar at the second end thereof, and as having a plurality of apertures disposed near the concave first end thereof, a pair of said apertures being axially disposed in the upper and lower sides of the back bar, a third of said apertures being disposed in the upper side of the back bar and in substantial longitudinal alignment with the back bar blade slot;

a saw blade having a first end portion, a medial portion and an opposed second end portion, in the assembled working mode of the saw the first end portion of the saw blade positionable within the first and second blade slots of the handle and the opposed second end portion of the saw positionable within the back bar blade slot of the back bar;

blade stop means supported by the first and second end portions of the saw blade for preventing passage of the first and second end portions of the saw blade through the first and second blade slots of the handle and through the back bar blade slot of the back bar so that the medial portion of the saw blade spans between the first end of the handle and the second end of the back bar when the saw is in its assembled working mode; and,

hook retainer means for interconnecting the handle and back bar together, in the saw working mode the hook retainer means being disposed through the axially aligned pair of apertures formed in the handle and engaging the back bar via the third aperture in the upper side thereof such that the hook retainer means, in combination with the tension of spanning the saw blade, secures the handle and back bar in a stable position, and in the storage mode the first end of the back bar being telescopically disposed within the hollow of the handle such that the third aperture in the handle is axially aligned with one of the first and second axially aligned apertures in the back bar such that a portion of the hook retainer means is disposed to engage the aligned third aperture of the handle and one of the first and second apertures of the back bar and to engage the first end of the handle so that the handle and back bar are secured together in the storage mode.

4,637,142

UNIVERSAL ADJUSTABLE WELD GAUGE

Kenneth R. Baker, 214 Kendra St., Vicksburg, Miss. 39180

Filed May 9, 1986, Ser. No. 843,398

Int. Cl.[4] G01B *5/02*

U.S. Cl. 33—169 D **8 Claims**

1. A gauge comprising first and second rectangular plates, said second plate terminating in an edge which traverses one corner thereof, the maximum length of width of said second plate being substantially the same as the length and width of the first plate, each plate having an elongated slot therein, said elongated slots being angled with respect to each other when the plates are overlapped with their length and width edges coinciding, and a spring biased fastening means extending through each of said slots to slideably secure said plates in a juxtaposed relationship, whereby the gauge may be used in measuring or checking the various dimensions of a weld.

4,637,143

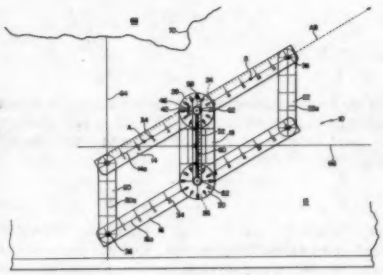
PLOTTING DEVICE

Norman C. Telles, 80 Middle Rd., Acushnet, Mass. 02743

Filed Apr. 1, 1985, Ser. No. 718,781

Int. Cl.[4] G01C *3/00*; B43L *7/06*

U.S. Cl. 33—457 **6 Claims**



1. A plotting device comprising first, second, third, and fourth legs, said first and second legs being substantially parallel, said third and fourth legs being substantially parallel, extending between said first and second legs, and being pivotally connected thereto so that said first, second, third, and fourth legs cooperate to define a collapsible, parallelogram structure, leg angle determining means for determining the relative angles between an adjacent connected pair of said legs, a vector element pivotally attached to one of said legs, and vector angle determining means located at the point of pivotal attachment of said vector element for determining the relative angle between said vector element and said leg to which it is attached, said vector element and said vector element angle determining means being adjustably positionable at a plurality of points along the longitudinal extent of said leg to which they are attached and remaining stationary with respect thereto when said first and second legs are pivoted relative to said third and fourth legs.

4,637,144

APPARATUS FOR MONITORING THE DIAMETERS OF CRANKPINS DURING TREATMENT IN GRINDING MACHINES

Roland Schemel, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 734,905

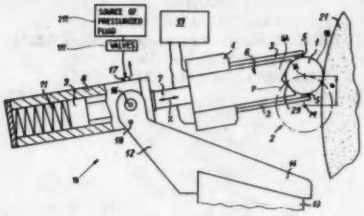
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424405

Int. Cl.[4] G01B *5/20*

U.S. Cl. 33—550 **27 Claims**

1. Apparatus for monitoring the diameters of round objects, particularly of substantially cylindrical workpieces during their treatment in a machine tool such as a grinding machine, comprising supporting means defining a predetermined axis and arranged to mount objects in positions such that the axis of the object which is mounted in said supporting means is parallel to said predetermined axis and the object is free to circulate about the predetermined axis along a predetermined path; a guide having an object-contacting portion; at least one sensor provided on said guide and arranged to track the periphery of an object which circulates along said path while said portion of

said guide contacts the periphery of the circulating object; detector means provided on said guide and arranged to monitor the position of said sensor; and carrier means for said guide,



said guide being mounted on said carrier means for movement substantially radially of said path and said carrier means defining for said guide a pivot axis which is at least substantially parallel to said predetermined axis.

4,637,145

LOW PRESSURE MICROWAVE DRYING APPARATUS

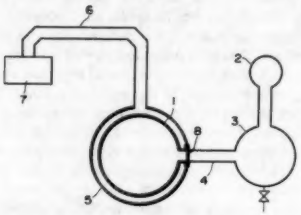
Ko Sugisawa; Yasushi Matsumura, both of Nara; Kazumitsu Taga, Neyagawa, and Ryuichi Hattori, Kyoto, all of Japan, assignors to House Food Industrial Company Ltd., Osaka, Japan

Filed Nov. 23, 1983, Ser. No. 554,861

Claims priority, application Japan, Nov. 24, 1982, 57-177993[U]

Int. Cl.⁴ F26B *23/08*

U.S. Cl. 34—1 **8 Claims**



1. A low pressure microwave drying apparatus which comprises a microwave-permeable and gas-impermeable drying chamber for drying a substance to be treated and a microwave-impermeable microwave applying chamber which encloses the drying chamber at a distance therefrom, the drying chamber being provided with a gas exhaust system and the microwave applying chamber being provided with a microwave generator, whereby a material being dried is subjected to a partial vacuum and the microwave generator operates at ambient pressure.

4,637,146

SPIN DRYER

Yasunari Motoki, Yokohama, and Yuji Ohkuma, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

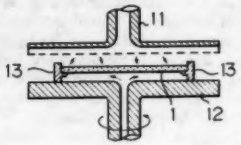
Filed Aug. 14, 1984, Ser. No. 640,643

Claims priority, application Japan, Sep. 19, 1983, 58-173546

Int. Cl.⁴ F26B *11/18*

U.S. Cl. 34—58 **6 Claims**

1. A spin dryer comprising a rotary stage for supporting a substrate to be dried, characterized in that said stage is provided with stopper means at the periphery of said substrate and periphery of said stage for supporting said substrate above the surface of said stage with the center of said substrate located eccentric with the shaft of said rotary stage, said substrate being fixed by said stoppers as said rotary stage rotates and a stationary cover is provided at a space from said substrate, said stationary cover having at least the same area as that of said



substrate, a number of openings being provided in the inner surface of said stationary cover facing said substrate and means for charging a drying gas through said cover and said cover openings onto said substrate for drying said substrate.

4,637,147

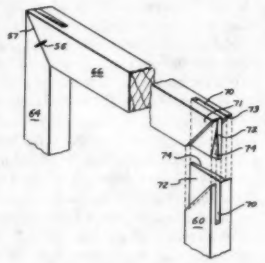
STRETCHER BARS

Clarence K. Wolsey, 441 Fairview, #3, Arcadia, Calif. 91006

Filed Apr. 30, 1985, Ser. No. 729,129

Int. Cl.⁴ D06C *3/08*

U.S. Cl. 38—102.1 **2 Claims**



1. For assembly in a generally rectangular stretch frame for artwork and the like, a plurality of elongated stretcher bars each having first and second end portions, a face surface and a rear surface,

each of said stretcher bars having at each of its said first and second end portions a face mitered section, a rear mitered section and a tongue therebetween, the mitered sections being adapted for abutting engagement to form miter joints, the first end portion tongue being adjacent to the face mitered section and the second end portion tongue being adjacent to the rear mitered section, each tongue section cooperating with one of the mitered sections to define a slot adapted to receive a tongue of another stretcher bar, and

at least one of the tongue sections of each stretcher bar defining a bevel on a corner portion thereof remote from the side defining said slot, thus to facilitate ready entry of the stretcher bar tongue sections into slots of mating adjoining bar tongue sections into slots of mating adjoining bars in non-interfering relationship with the tongue and mitered sections of mating bar end portions.

4,637,148

ELECTROLUMINESCENT BADGE

Dane D. Barlow, 27840 Palmer La., Madison Heights, Mich. 48071

Filed Jul. 8, 1985, Ser. No. 752,618

Int. Cl.⁴ A44C *3/00*

U.S. Cl. 40—1.5 **14 Claims**

1. A badge comprising:

an electroluminescent panel having an outwardly facing planar surface which directly generates and radiates illum-

ination when excited by an alternating current at a first potential;

a means for securing said panel to the wearer;

a battery for supplying direct current at a second potential; and

an electronic circuit receptive of said direct current for transforming said direct current into alternating current at said first potential and for suppling said transformed current to said panel said electronic circuit comprising a resonant tank circuit, a transistor amplifier coupled to said tank circuit, a transformer having a primary coupled to said transistor amplifier and having a secondary coupled to said panel, and a negative feedback means coupled between said secondary and said tank circuit to maintain oscillation and to thereby deliver alternating current to said panel to produce illumination.

4,637,149

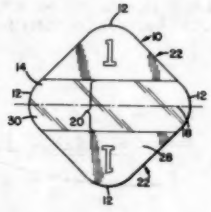
SEMI-PERMANENT FILING, FLAGGING AND INDEXING SYSTEM

Bernard W. Rivkin, 16287 Oak Creek Trail, Poway, Calif. 92064

Filed Aug. 15, 1983, Ser. No. 523,359

Int. Cl.⁴ A01B *23/06*

U.S. Cl. 40—2 R **23 Claims**



1. A flag comprising a unitary sheet of thin semi-rigid flexible material having a central adhesive-bearing section on one side and two enlarged adhesive-free tabs flanking said adhesive-bearing section, said flag being adapted to be releasably attached to a host along a proximate free edge of said host such that one of said flag adhesive-free areas protrudes from the edge of said host, while the other flag adhesive-free area overlays a portion of said host.

4,637,150

LIGHT BOX FOR PROVIDING A BACKGROUND ILLUMINATION HAVING BRIGHTNESS VALUES LOCALLY ADJUSTED TO THE DENSITY OF A TRANSPARENCY TO BE VIEWED BY MEANS OF THE LIGHT BOX

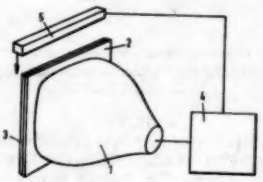
Ronald J. Geluk, Nootdorp, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed May 17, 1985, Ser. No. 735,801

Claims priority, application Netherlands, May 18, 1984, 8401605

Int. Cl.⁴ G02B *27/02*

U.S. Cl. 40—361 **6 Claims**



1. An assembly for viewing a tranparency, such as an X-ray photograph, which comprises:

a screen for viewing said transparency, said transparency being positioned in front of said screen;

a light source means for illuminating said screen, said light source means capable of forming a light beam on controlled location and intensity on said screen;

means for controlling said light source means to illuminate said screen in accordance with a two-dimensional distribution of brightness level values adjusted to local density of said transparency;

a photosensitive detection means for scanning said transparency for measuring local brightness level values representative of local light intensity levels of said transparency;

random access memory means having memory locations corresponding to said two-dimensional distribution of brightness level values for storing in said memory location said brightness level values measured by said photosensitive detector means; and

a control device for modulating intensity of said light beam of said light source means inversely proportional to said brightness level values read out from said random access memory.

4,637,151

COMBINATION STADIUM CUSHION AND PENNANT

Samuel D. Love, 13510 Old Indian Head Rd., Brandywine, Md. 20613, and Mialan V. Love, 10145 Scotch Hill Dr., Upper Marlboro, Md. 20745

Filed Sep. 26, 1985, Ser. No. 780,637

Int. Cl.⁴ G09F *7/00*

U.S. Cl. 40—584 **7 Claims**

1. A combination portable stadium cushion and pennant, comprising:

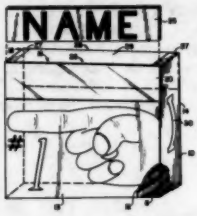
cushion means for providing a cushioned seat;

a message display means mounted to a top part of said cushion means and comprising an inverted U-shaped member having a plurality of pockets formed in side walls thereof; wherein:

said inverted U-shaped member has openings into said pockets at top edges thereof;

said pockets are slightly larger than a bumper sticker-like

means and made of a transparent material, so that said bumper sticker-like means can be recieved slidably and



removably in said pockets with information on said bumper sticker-like means visible through said display means.

4,637,152

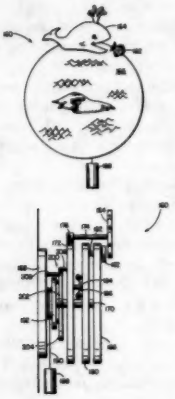
ROTARY DRIVE MECHANISM FOR ENERGIZING TOYS, KINETIC SCULPTURES, OR THE LIKE

David C. Roy, 32 Frontage Rd., Stafford Springs, Conn. 06076

Filed May 11, 1983, Ser. No. 493,726

Int. Cl.[4] G09F *11/04*

U.S. Cl. 40—495 **9 Claims**



1. An intermittent rotary drive for toys, kinetic sculptures, and the like comprising:

a mounting structure defining a horizontal axis of rotation in an operative position of the structure;

a driving wheel mounted on the structure for rotation about the horizontal axis;

motive means connected to the driving wheel for rotating the driving wheel in one direction about the horizontal axis;

a driven inertia wheel mounted coaxially of the driving wheel for free rotation about the axis, the driven inertia wheel being rotationally unbalanced with a heavier portion of the wheel disposed at one side of the wheel in offset relationship from the axis of rotation whereby the heavier portion seeks a low point when rotation of the wheel about the horizontal axis stops; and

escapement means intermittently connecting the driving and driven wheel for causing the driving wheel to engage and rotate the driven wheel in the one direction about the axis and allowing the driven wheel to rotate in the one direction relative to the driving wheel whereby the driven wheel can advance rotationally ahead of the driving wheel in the one direction and the heavier portion of the driven wheel can stop or reverse the rotation in the one direction until the escapement means brings the driving wheel and the driven wheel back into engagement.

4,637,153

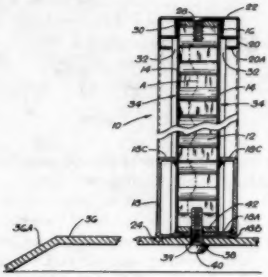
MULTIPLE CONFIGURATION DISPLAY SIGN SYSTEM

Michael Kane, River Forest, and Lawrence R. Hogan, Lake Villa, both of Ill., assignors to Kane Graphical Corporation, Chicago, Ill.

Filed Jun. 11, 1984, Ser. No. 618,955

Int. Cl.[4] G09F *7/00*

U.S. Cl. 40—605 **26 Claims**



1. A mutliple configuration display sign system comprising:

at least five upright sign units, each unit having at least two display faces, a top side, a bottom side and two opposite vertical sides;

top side linking means for linking the top sides of the units; and bottom side linking means for linking the bottom sides of the units; the top side linking means and the bottom side linking means in combination joining the units by abutting together their vertical sides to arrange the units in vertical side-by-vertical side relationship and thereby forming a closed substantially pentagonal configuration wherein only one display face of each unit is presented for display of alpha-numeric indicia and wherein the top side linking means and the bottom side linking means include a plurality of generally triangular plates, each plate having a peripheral edge configuration so that when the plates are abutted together the peripheral edges form a substantially pentagonal configuration.

4,637,154

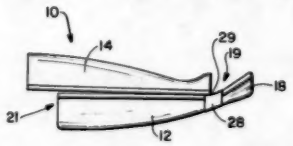
BULL ELK CALLING DEVICE

Donald R. Laubach, P.O. Box 127, Gardiner, Mont. 59030

Filed Mar. 14, 1986, Ser. No. 839,779

Int. Cl.[4] A01M *31/06*; A63H *5/00*

U.S. Cl. 43—1 **2 Claims**



1. A bull elk calling device comprising:

a first and second rectangular, substantially coextensive, planar members;

the first and second members being hingedly joined along corresponding longitudinal edges thereof, but with the first and second members being offset from one another thereby creating a lip portion of the first member extending beyond the second member at a first end of the device;

the first and second members being bowed along their longi-

tudinal axes thereof having a first bow at the first end of the device which is of small size which bow continues into a bow of larger size at a second end of the device opposite the first end;

the first and second members being positioned opposing one another with their open concave sides facing one another to form a double-tapered cavity at the first end thereof sandwiched between the first and second members and extending in a direction transverse to their longitudinal axes;

an endless elastic band is stretched around the first member transverse to the longitudinal axis of this member on the lip portion of the first member and is positioned at the entrance into the cavity formed between the first and second members to form a reed element;

the first and second members further being constructed of resilient and flexible material such that when the two members are squeezed together, the size of the double-tapered cavity is substantially reduced beginning a the ends of the double-tapered cavity and working towards the center of the cavity and when pressure on the two members is released, the size of the double-tapered cavity is restored to its normal size.

4,637,155

KEEPNETS

Michael D. A. Johnson, Flat D, 1 Morpeth Terrace, Westminster, London SW1 P1EN, England

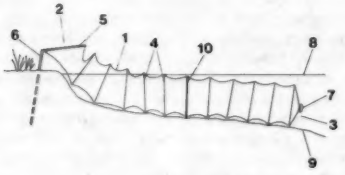
PCT No. PCT/GB85/00230, § 371 Date Jan. 27, 1986, § 102(e) Date Jan. 27, 1986, PCT Pub. No. WO85/05537, PCT Pub. Date Dec. 19, 1985

PCT Filed May 29, 1985, Ser. No. 828,330

Claims priority, application United Kingdom, May 31, 1984, 8413898; Jan. 12, 1985, 8500899

Int. Cl.⁴ A01K *69/02, 79/00*

U.S. Cl. 43—7 **18 Claims**



1. A keepnet comprising an elongate tubular net open at one end and closed at the other, a substantially rigid ring or frame at the open end serving to hold open the mouth of the net, and a terminal ring or frame at the closed end thereof, said net being supported by and fixedly attached to a plurality of rings or frames along the length thereof intermediate said mouth-ring or frame and said terminal ring or frame, said rings or frames being spaced and self supportive when operably placed within a body of water and freely collapsible upon each other when removed from said body of water, wherein the improvement comprises: at least one of said intermediate rings or frames being substantially rigid whilst the majority thereof are substantially flexible relative to said at least one substantially rigid ring, and said mouth-ring or frame being sufficiently larger than said intermediate rings or frames including said at least one substantially rigid ring or frame, to permit passage of the latter therethrough, whereby a portion of the keepnet may be collapsed and said at least one substantially rigid ring can serve as a secondary mouth-ring during removal of fish from said net and the effective length of the net is reduced during said removal of fish.

4,637,156

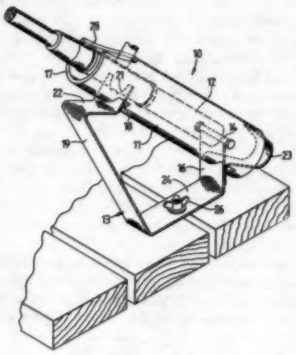
ROD HOLDER

Billy R. Simmons, Odenville, Ala., assignor to Nancy B. Crews, Odenville, Ala., a part interest

Filed Jun. 19, 1986, Ser. No. 875,972

Int. Cl.⁴ A01K *97/10*

U.S. Cl. 43—21.2 **14 Claims**



1. Apparatus for holding a fishing rod having a handle portion and a reel mounting bracket, comprising:

(a) a tubular member having a length greater than the handle portion of said rod and a diameter greater than said handle portion and having a transverse slot through its under surface near one end thereof;

(b) a mounting bracket pivotally attached to said tubular member distal said one end and having a first upright portion extending upwards through said transverse slot;

(c) spring means for biasing said one end downwardly; and

(d) means for fastening said mounting bracket to a support surface.

4,637,157

MULTI PART BUTT AND REEL SEAT USED ON FISHING RODS

Stuart M. Collins, 526 NE. 190 St., North Miami Beach, Fla. 33179

Filed Apr. 7, 1986, Ser. No. 848,769

Int. Cl.⁴ A01K *87/06*

U.S. Cl. 43—22 **9 Claims**

1. A multi part butt assembly of the type designed for use on a trolling type fishing rod, said assembly comprising:

(a) a shank portion formed of rigid, high strength material and having an elongated configuration and a substantially hollow interior portion extending along the length of said shank portion,

(b) a first hole formed in one end of said shank and a second hole formed in an opposite end of said shank, said first and said second holes disposed in coaxial relation to one another,

(c) a gimble portion including an elongated finger defining a leading end thereof, said finger including an open channel for seating the fishing rod and an outside diameter of lesser dimension than a trailing end of said gimble portion,

(d) said gimble portion fixedly secured to said shank portion

by passing said finger portion through said first hole and into a press fitted engagement with an interior surface of said shank portion adjacent said first hole,

(e) a guide tube having an elongated configuration including one end press fitted into fixed engagement with an interior surface of said shank portion adjacent said second hole and extending outwardly therefrom through said second hole in coaxial disposition to said shank portion,

(f) a reel seat tube telescopically disposed and supported on an outwardly protruding end of said guide tube and including an exteriorly threaded surface along at least a portion of the length thereof,

(g) a fixed hood secured adjacent one end of said reel seat tube and a movable hood being movably mounted on said exterior threaded surface for selective movement towards and away from said fixed hood,

(h) said reel seat tube further including locking means mounted thereon adjacent said movable hood for locking position thereof relative to said fixed hood,

(i) said guide tube having an internal diameter along its length sufficient to slidingly receive a rod blank in close contact therein,

(j) said hollow interior portion having a straight line configuration and a substantially common inner diameter along its length from said opposite end adjacent said second hole to a point substantially adjacent said gimble portion.

4,637,158

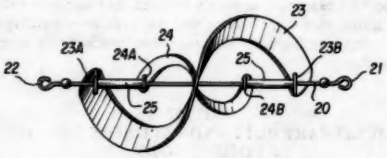
ARCHIMEDIAN SCREW TYPE SPINNER LURE

Dennis D. Reid, P.O. Box 246, Schriever, La. 70395

Filed Apr. 11, 1986, Ser. No. 850,831

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.19 **6 Claims**



1. An archimedian screw spinner lure comprising a shaft having a line connector at one end and a hook and bait connector at the other end, a first archimedian screw spinner rotatably mounted on said shaft, a second archimedian screw spinner having an internal flight diameter greater than the external flight diameter of said first screw so that said first screw spinner will freely rotate within said second screw spinner, and spacer means carried by said shaft positioned between the rotary mounts of said first and second archimedian screw to position the first and second screws so that each may rotate relative to the other in either clockwise or counterclockwise direction depending upon flight direction of each screw to assure free independent movement of each screw relative to one another.

4,637,159

ARTIFICIAL EYE

Joseph E. Kulis, 280 Grand Blvd., Beford, Ohio 44146

Filed Oct. 28, 1985, Ser. No. 792,058

Int. Cl.[4] A61F *1/16*

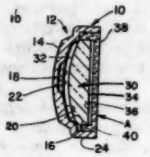
U.S. Cl. 43—42.32 **18 Claims**

1. A simulated eye construction comprising:

a generally cup-shaped member including a protruding transparent first lens portion having a convex outer face;

a transparent second lens member positioned in said cup-shaped member behind said first lens portion;

reflecting means positioned behind said second lens member for reflecting at least some of the light entering said cup-shaped member back through said first and second lens members;



closure means for closing the open end of said cup-shaped member; and,

holding means for holding said second lens in place in said cup-shaped member.

4,637,160

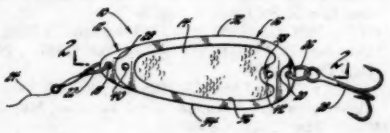
FISH SKIN LURE

Andrew L. Biskup, 6N480 Fairway La., Itasca, Ill. 60143

Filed May 29, 1986, Ser. No. 868,005

Int. Cl.[4] A01K *85/04*

U.S. Cl. 43—42.33 **18 Claims**



1. A lure for casting or trolling for fish and adapted to be connected to the line of an angler's tackle at one end and adapted to support a hook at the other end, a base member, a fish skin from a fish covering one surface of said base member, a holder member having an outer configuration in general conformity with the outer configuration of said base member and adapted to be moved relative to said base member, said holder member overlying said fish skin and having an opening formed therein of a length substantially equal to the length of said base member so as to expose a major portion of said fish skin, and fastening means for fixedly connecting said holder member to said base member so as to compress portions of said fish skin therebetween and maintain said fish skin on said base member while said lure is in the water.

4,637,161

APPARATUS FOR UNDERGROUND INSECT AND ANIMAL EXTERMINATION

Loren J. Turner, 2125 E. Roby Ave., Porterville, Calif. 93257

Filed Jul. 1, 1985, Ser. No. 750,494

Int. Cl.[4] A01M *1/20, 19/00*

U.S. Cl. 43—130 **14 Claims**

1. An apparatus for exterminating underground insects and animals, said apparatus including an upstanding tubular ground probe, means at the upper end of said probe for attaching the outlet end of a pressurized steam supply hose thereto, a downwardly domed shield mounted on the lower of said probe for sliding movement therealong and with said probe extending centrally downwardly through said shield, said shield and probe including coacting means limiting downward movement

of said shield along said probe, said shield including a downwardly opening vent outlet opening for venting steam from

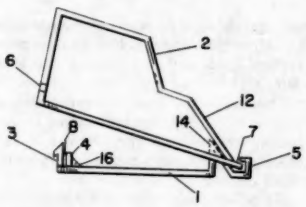
beneath said said shield, said vent outlet opening being spaced above the lower periphery of said shield.

4,637,162

TAMPER-PROOF RODENT BAIT STATION

Daniel A. Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90069

Filed Jan. 31, 1986, Ser. No. 824,881
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 **1 Claim**



1. A tamper-proof rodent bait station consisting of a top and base member, the top member having an animal entrance hole on each of two sides and having a plurality of locking tabs and slots that cooperate to form a tamper-proof seal between the top and base; said base being constructed with upwardly extending independent barbed tabs that face outwardly and that are capable of being flexed backwards to release the cover member from the base member, with said base member also containing a reinforced restricting plate located directly behind said flexible tabs and positioned a metered distance from the independent tabs to allow only that movement necessary to release the tab from the slot, releasing the cover member.

4,637,163

METHOD OF GROWING EDIBLE MUSHROOMS

Markku Pellinen, Otalampi; Yrjö Mälkki, and Aimo Niskanen, both of Espoo, all of Finland, assignors to Valtion Teknillinen Tutkimuskeskus, Finland

PCT No. PCT/FI84/00044, § 371 Date Feb. 13, 1985, § 102(e) Date Feb. 13, 1985, PCT Pub. No. WO85/00002, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 14, 1984, Ser. No. 709,689
Claims priority, application Finland, Jun. 14, 1983, 832135
Int. Cl.[4] A01G *1/04*
U.S. Cl. 47—1.1 **7 Claims**

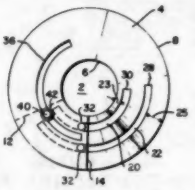
1. A method of producing wood-rotting edible mushrooms *Lentinus edodes, Kuehneromyces mutabilis,* Pholiota spp. and Pleurotus spp. utilizing a bed material mixed from a carbohydrate, lignin and protein containing compound material and minor amount of peat, said bed comprising mainly a cellulose containing material, minor amounts of proteinaceous and farinaceous substance as well as water, said method comprising adjusting the bed material to pH value below 5 prior to heating, packing the bed material into packages and heating the packages to an internal temperature of at least 80 and not higher than 100° C., firming the substrate bed without the use of a form; transferring a mushroom mycelium onto the bed; growing the mycelium in the bed at a temperature suitable for the species and strain; and removing the bed from the package for the production of edible mushrooms.

4,637,164

SQUIRREL GUARD

Harold O. Brown, 170 Landor Pl., Athens, Ga. 30606

Filed Feb. 20, 1986, Ser. No. 831,709
Int. Cl.[4] A01G *17/12*
U.S. Cl. 47—24 **17 Claims**



1. An animal guard for tree trunks comprising:

(a) an annular flexible plate having a central circular opening therein and a skirt portion completely around said central opening:

(b) said skirt portion having at all times a constant width and an inner and outer periphery;

(c) said plate having a first flat planar position and a second truncated conical position and having at least one radial slit extending completely through said skirt from said inner to said outer periphery;

(d) said radial slit forming said plate into a separable member having first and second radial edges of said slit when in said first flat position for permitting said plate to be positioned about a tree trunk;

(e) a pair of spaced fastener holes in said skirt radially aligned and position adjacent said first radial edge of said slit, one of which is the inner and the other of which is the outer fastener hole;

(f) a pair of spaced parallel arcuate slots in said skirt and radially spaced from each other one of which is the inner and the other of which is the outer arcuate slot;

(g) said arcuate slots being radially positioned so that said inner fastener hole and said inner arcuate slot and said outer fastener hole and said outer arcuate slot cooperate with each other respectively when said plate is in said second truncated conical position;

(h) each of said arcuate slots being spaced radially from the axis of said plate a distance substantially equal to the radial distance from the axis of said plate to their respective fastener holes;

(i) said arcuate slots being adjacent a second radial edge and extending arcuately in a direction away from said second radial edge through a substantial degree of arc;

(j) said inner arcuate slot and said inner fastener hole being a substantial distance closer to the inner periphery of said plate than said outer fastener holes and said outer arcuate slot is to said outer periphery of said plate so as not to provide a gripping surface for an animal attempting to pass said tree guard;

(k) whereby when said plate is formed into said second truncated conical position and fastener means are positioned in said holes and through said arcuate aligned slots for positioning about a tree trunk, said plate may be adjusted to trunk size and said fastener means locked to

prevent slippage in said slots thereby maintaining a tight fit at all times about said trunk;

(l) said plate includes a third arcuate slot extending radially from the axis of said plate along a position uniformly between said inner and said outer fastener holes in an arcuate direction away from said first radial edge and extending in a direction opposite to said inner and outer arcuate slots a distance substantially equal to said substantial degree of arc of said inner and outer arcuate slots, said third acruate slot is positioned intermediate said first and second arcuate slots; and,

(m) a fastening notch formed in said second radial edge so as to align and cooperate with said third arcuate slot when said plate is in said second truncated conical position.

4,637,165

CORNER DEFLECTION ASSEMBLY

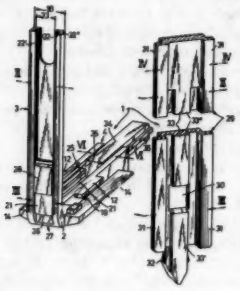
Alfred Schneider, Kreuztal, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,275

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 8304739[U]

Int. Cl.⁴ E05D *15/52*

U.S. Cl. 49—192 **19 Claims**



1. Corner deflector assembly of a connecting rod type lock, insertable into undercut, profiled grooves of the frame profiles of windows and doors of metal, plastic, or the like, having an angled casing enclosing a deflection member of flexible bands, the angled casing having a first leg and a second leg, each of the legs of the angled casing guiding an intermediary connection member connected with the deflection member, in which the first leg has a smaller cross sectional height than the second leg, and in which the intermediary connecting member guided by this first leg serves at the same time as a sliding bolt and displays a cam which is guided in an elongated slot at the outside of the first leg, characterized by the fact that:

the elongated slot (23) guiding the cam (28) passes through the first leg (3) to the apex (27) of the angled casing and is opened at the outside of the second leg (4) and that the intermediary connecting member which forms a sliding bolt (29) engages in the elongated slot (23) of the first leg (3) by means of a longitudinal batten (33) molded onto the underside, said batten being carried through up to the free end of a bolt tongue (32).

4,637,166

WIRE COMPENSATOR FOR A WIRE DRIVING WINDOW REGULATOR

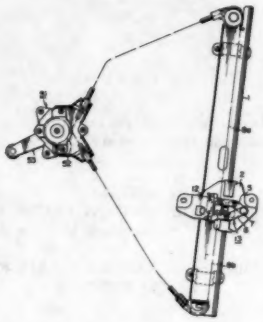
Hiroshi Ujihara, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Sep. 11, 1985, Ser. No. 774,917

Claims priority, application Japan, Sep. 14, 1984, 59-138755[U]

Int. Cl.⁴ E05F *11/48*

U.S. Cl. 49—352 **5 Claims**



1. A wire compensator for a wire driving window regulator in which a carrier plate attached to a window glass is mounted onto a vertical guide rail to be raised and lowered freely, flexible wires are extended from a gearing device to the carrier plate along said guide rail so as to form substantially a closed loop and to be driven in either normal and reverse directions by the gearing device along the closed loop, and each end portion of said flexible wires is engaged with said carrier plate, characterized by that:

a pair of moveable levers comprising two lever members pivotally mounted to the carrier plate and separated at a certain distance with each other, said each end portion of the wires is secured to said levers, and said levers are biased by means of a spring in a direction for giving tension to the wires, so that the lever members may be rotated by the elasticity of the spring and elongation of the wires can be absorbed to keep the wires stretched at a certain tensile strength.

4,637,167

DOOR

Torsten Svensson, Sollentuna, Sweden, assignor to Termofrost Sweden AB, Spanga, Sweden

Filed Feb. 11, 1985, Ser. No. 700,314

Int. Cl.⁴ E05F *1/10*

U.S. Cl. 49—386 **3 Claims**

1. A door for refrigerating and freezer chambers, comprising a door frame, which supports at least one glass pane for exposing through the door refrigerated or frozen goods in said chamber, which door frame at one vertical edge (7), via an elongate first frame section, is intended to be hingedly sus-

pended in a door case (2) and which door frame and door case cooperate with a torsion spring (11) having two ends, said torsion spring (11) being locked at one of its ends relative to the door frame and at the other of its ends relative to the door case, wherein nipples or the like connect to the torsion spring at its upper end (12) and its lower end (13), said nipples or the like, formed as journals (17,18), cooperate with associated bearing means (20, 21) in the door case (2) to thereby pivotally suspend said door; characterized in that means in said door rigidly secure said one vertical edge (7) of said first door frame section (6) to and along only one edge of the glass pane in a U-shaped groove (8) provided along the entire length of said first frame section (6) to provide the sole support for the door; said first frame section comprising an inner longitudinal cavity (10) provided along the entire length of the section, in which cavity said torsion spring extends along substantially the whole length of the section (6); and the remainder of the door frame comprises at least one thin non load bearing strip (25) mounted along each of the remaining three edges of the glass pane.

4,637,168

SPECTACLE LENS EDGE GRINDING MACHINE

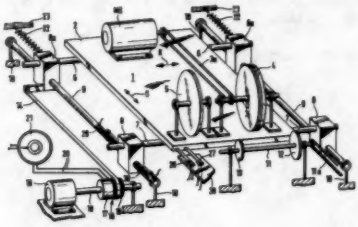
Fritz Kötting, Dormagen, and Günther Barwasser, Neuss, both of Fed. Rep. of Germany, assignors to Wernicke & Co. GmbH, Düsseldorf-Eller, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 502,098, Jun. 8, 1983, abandoned. This application May 22, 1985, Ser. No. 736,801

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221713

Int. Cl.⁴ B24B *17/02*

U.S. Cl. 51—50 PC **14 Claims**



1. A spectacle lens edge grinding machine, comprising:

a machine frame;

a support mounted on and movable relative to said machine frame;

a grinding wheel mounted on said support;

a template abutment mounted on said support;

a support shaft for a spectecle lens and a template, said support shaft being fixedly mounted on said machine frame; with said support being movable toward and away from said support shaft;

a spring arrangement operatively associated with said machine frame and said support for bringing the latter into a starting position; said spring arrangement, when viewed in the direction of movement of said support toward said support shaft, acting on that side of said support which is remote from said support shaft; and

a tensioning device operatively associated with said machine frame and said support for effecting movement of the latter toward said support shaft; said tensioning device, when viewed in the direction of movement of said support toward said support shaft, acting on that side of said support which faces said support shaft; said tensioning device being actuatable, and the tensioning force thereof being regulatable to go beyond variation of pressure of engagement of the lens before beginning of grinding procedure to vary the pressure during such grinding procedure dependent upon the shape and the resulting edge thickness of the lens being ground in such grinding procedure, such variation of pressure engagement of tbe lens including less grinding pressure of engagement when grinding a thinner edge portion of the lens edge and greater grinding pressure when grinding a thicker edge portion of the lens.

4,637,169

APPARATUS FOR CONTROLLING THE ADVANCE OF A MACHINE TOOL TOWARD A WORKPIECE

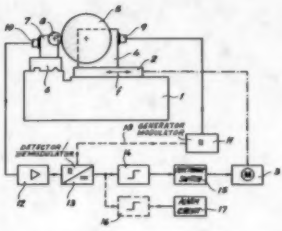
Hans Sigg, Neuchatel, Switzerland, assignor to Meseltron SA, Corcelles, Switzerland

Filed Aug. 16, 1985, Ser. No. 766,373

Claims priority, application France, Aug. 27, 1984, 84 13326

Int. Cl.⁴ B24B *49/10*

U.S. Cl. 51—165.77 **7 Claims**



1. A machine tool apparatus for controlling the advance of a tool (5) during its approach toward a workpiece (8), said machine tool apparatus comprising:

(a) a framework (1),

(b) means (3) for moving said tool on said framework with respect to said workpiece between a non-engaged inoperative position and an engaged operative position of said tool with respect to said workpiece,

(c) acoustic energy generating means (9) for periodically applying acoustic energy to a first element constituted by said tool and said workpiece, said acoustic energy having a predetermined frequency,

(d) modulating means operatively coupled to said acoustic energy generating means for modulating said energy,

(e) acoustic energy detecting means (10) for detecting in a second of said elements acoustic energy at said predetermined frequency exceeding a predetermined level,

(f) demodulating means operatively coupled to said acoustic energy detecting means for demodulating detected acoustic energy, and

(g) control signal generating means associated with said acoustic energy detecting means and said demodulating means for generating a control signal upon detection and demodulation of said acoustic energy, said control signal generating means being connected to said moving means to reduce speed thereof when said control signal is applied thereto.

4,637,170

ABRASIVE APPARATUS

Aleck Block, 800 Warner Ave., Los Angeles, Calif. 90024

Filed Jan. 17, 1985, Ser. No. 692,234

Int. Cl.⁴ B24B *41/04*

U.S. Cl. 51—168 **43 Claims**

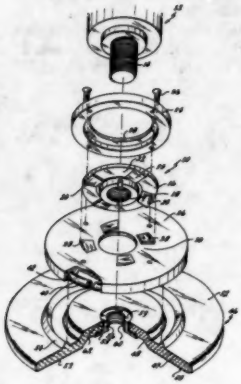
1. In combination for use with an abrasive disc having first and second spaced and parallel faces and including abrasive particles on the first face to act upon a workpiece,

a threaded arbor,

a camming member disposed on the arbor and having an internally threaded bore and having a first face and having at least one inclined surface on the first face, and

a reinforcing plate having an internal bore and disposed on the arbor and having a first face disposed in cooperative

relationship with the first face on the camming member and having on the first face at least one inclined surface cooperative with the inclined surface of the camming member for variable positioning axially along the arbor in accordance with the relative dispositions of the inclined surfaces on the camming member and the reinforcing plate,



the reinforcing plate being disposed on the arbor and having a second surface displaced from the first surface for a clutching relationship with the second face of the abrasive disc and for a positive engagement between the abrasive disc and the reinforcing plate upon the variable positioning of the inclined surface of the first face of the reinforcing plate relative to the inclined surface on the first face of the camming member.

4,637,171

METHOD OF CONTINUOUS COMPENSATION OF UNBALANCE PRESENT IN A ROTOR AND IN PARTICULAR IN A GRINDING WHEEL

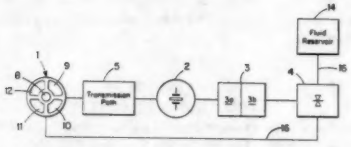
Roland Menigat, Liederbach, and Klaus Gruppenbacher, Dieburg, both of Fed. Rep. of Germany, assignors to Hofmann Werkstatt-Technik GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,146

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3503724

Int. Cl.[4] B24B *41/04*

U.S. Cl. 51—281 R **6 Claims**



1. A method of continuous compensation of unbalance present in a rotor, wherein a compensation fluid is fed into correction chambers rotating with and arranged on said rotor at various angular locations, said supply of fluid being effected in successive balancing operations during rotation of said rotor as a function of the initial unbalance of said rotor as determined by a transducer, the method comprises:

performing a balancing operation with a lesser quantity of said compensation fluid than determined for balancing as a function of said initial unbalance by initially feeding said lesser quantity of said compensation fluid into a certain correction chamber;

determining the phase shift between the actual angular location of said initial unbalance and respective location of vibratory motion represented by transducer outputs;

determining the amplitude transmission error indicating the difference between said actual amount of unbalance and respective transducer output, said amplitude transmission error being based upon a measurement of residual unbalance, said initial unbalance, said lesser quantity of said compensation fluid first fed into said certain correction chamber and said angular location of said chamber; and

feeding a quantity of compensation fluid determined for the compensation of said residual unbalance into said correction chambers based upon said phase shift.

4,637,172

METHOD AND APPARATUS FOR TREATING OPEN-END FRICTION SPINNING ROLLERS

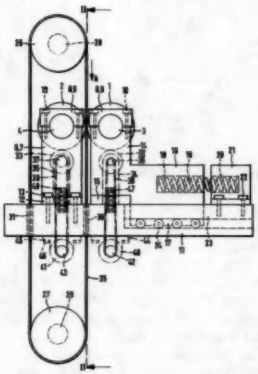
Rolf Griesinger, Göppingen-Faurndau, and Gerhard Fetzer, Süssen, both of Fed. Rep. of Germany, assignors to Spindelfabrik Sussen, Schurr, Stahlecker, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,464

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343484

Int. Cl.[4] B24B *21/02*

U.S. Cl. 51—289 R **21 Claims**



1. A process for treating cylindrical surfaces of two rollers of a pair of friction rollers used in an open-end friction spinning unit prior to installation in said spinning unit having said rollers of said pair of rollers arranged in a position that corresponds to their operational position forming a wedge-shaped yarn-forming gap along the length of which gap yarn is formed, comprising:

rotatably mounting said rollers of said pair of rollers adjacent one another on receiving means in an apparatus outside said spinning unit in a position that corresponds to their relative operational position in said spinning unit,

rotating each said rotatably mounted roller about its longitudinal axis, and

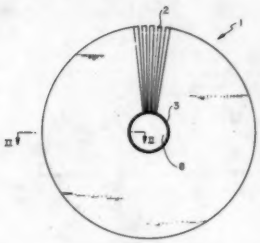
treating said cylindrical surfaces of each said roller simultaneously with a common surface treating means.

4,637,173

ROTATING GRINDING OR POLISHING DISC

Keld O. Hundebol, Ansager, Denmark, assignor to Udviklingscentret Hansen & Hundebol A/S, Ansager, Denmark

Continuation-in-part of Ser. No. 395,001, Jun. 30, 1982, Pat. No. 4,518,452. This application Jan. 25, 1985, Ser. No. 694,686
Claims priority, application Denmark, Nov. 24, 1980, 4998/80; PCT Int'l Appl., Nov. 20, 1981, PCT/DK81/00104
Int. Cl.[4] B24B 9/02
U.S. Cl. 51—334 5 Claims



1. A grinding or polishing disc comprising:

a member formed from a substantially rectangular slitted, flat sheet of material folded and shaped to have a central ring defined by two substantially parallel layers joined at an edge having a circular configuration which defines a central hole;

radial grinding or polishing segments extending radially from the central ring in two substantially parallel layers; and

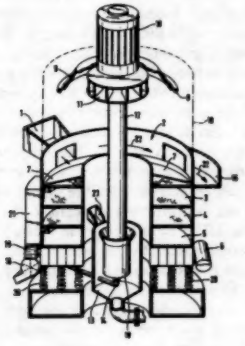
a string of adhesive material situated between the parallel layers along said edge of said central ring for securing the two layers of said central ring together and maintaining said sheet in said circular configuration.

4,637,174

DEVICE AND METHOD FOR THE SURFACE TREATMENT OF COLD-EMBRITTLED PARTS

Sabine Donath, Oberhausen, and Peter Holz, Linnich, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,863
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430529
Int. Cl.[4] B24C 9/00
U.S. Cl. 51—425 4 Claims



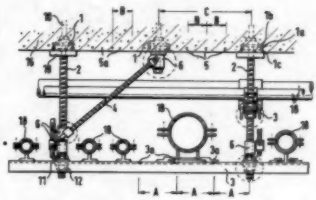
1. In a device for the surface treatment of cold-embrittled parts by jet treatment with granulate drawn from a collecting tank and recirculated, and by spraying with a low boiling liquefied gas, comprising a centrifuge wheel throwing off granulate in horizontal direction, a deflecting collar ring arranged around the centrifuge wheel for reflecting the granulate towards the work surface, spray nozzles for the low boiling liquefied gas and a treatment surface which is part of a cradle, with screens for separating granulate, coarse waste and dust, the improvement being means whereby the treatment surface is of circular shape and has the same shape and size as the abrasive jet pattern, said centrifuge wheel being self-priming, said granulate collecting tank being connected to said centrifuge wheel via a suction pipe, said spray nozzle for said low boiling liquefied gas being arranged in the inlet zone of said suction pipe, said treatment surface and said abrasive jet pattern being ring shaped, and said suction pipe extending concentrically through said treatment surface.

4,637,175

CONSTRUCTION FOR FASTENING PARTS TO A CONCRETE WALL

Helmut Froening, and Mohamed Basyouni, both of Mannheim, Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,600
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224986
Int. Cl.[4] F16L 3/22; E04B 1/38
U.S. Cl. 52—27 24 Claims



1. A construction for fastening parts to a concrete wall comprising:

a grid matrix embedded in said concrete wall and having uniformly shaped grid units,

a plurality of anchors attached to said embedded grid in said concrete wall at uniformly spaced distances to one another,

a plurality of supporting rods, each supporting rod extending from one of said anchors, and

a plurality of beams releasably attached to at least one supporting rod and being suitable for attachment of parts thereto, wherein said anchors are provided with an annular groove, which is engaged by four grid rods forming a grid unit of the grid matrix.

4,637,176

ELEVATOR AIR LOCK

George W. Acock, Jr., Columbus, Ohio, assignor to James A. Rhodes, Columbus, Ohio

Filed Oct. 15, 1985, Ser. No. 786,995
Int. Cl.[4] B66B 9/00
U.S. Cl. 52—30 13 Claims

1. A pressurized multi-story building having a pressure transition chamber and air lock, said building comprising:

a plurality of walls, a roof, and a plurality of floors, all cooperating to define a multi-story building including a ground floor and at least one upper floor;

a pressurization system for pressurizing the interior of at least some of said upper floors to an elevated pressure, above ambient atmospheric pressure, while leaving at

least said ground floor substantially at ambient atmospheric pressure;

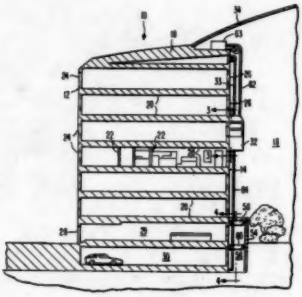
an elevator system including an elevator car having an elevator door, a plurality of elevator shaft doors, one elevator shaft door positioned at each floor of the multi-story building, and means mounting said elevator car for movement to positions corresponding to each floor of the multi-story building with the elevator car door adjacent the elevator shaft door of the floor, said elevator car door and the elevator shaft door for such floor then being openable and closable in concert to permit passage between such floor and the interior of the elevator car;

first sealing means providing a substantially airtight seal on said elevator car door when said elevator car door is closed;

second sealing means providing a substantially airtight seal on the elevator shaft doors of at least those floors at substantially ambient atmospheric pressure when such elevator shaft doors are closed;

pressurization means for pressurizing the interior of said elevator car to a pressure above ambient atmospheric pressure as said elevator car moves from a floor at ambient atmospheric pressure to a floor at said elevated pressure; and

depressurizing means for depressurizing the interior of said



elevator car from said elevated pressure as said elevator car moves from a floor at said elevated pressure to a floor at ambient atmospheric pressure;

whereby, with said elevator car at a floor at ambient atmospheric pressure and with the elevator shaft door of such floor and the elevator car door open, the elevator car interior is substantially at ambient atmospheric pressure and when the elevator car door and the last-named elevator shaft door then close and the elevator car moves to a floor at said elevated pressure, the elevator car interior is pressurized to a pressure above ambient atmospheric pressure, and with said elevator car at a floor at said elevated pressure and with the elevator shaft door of such floor and the elevator car door open, the elevator car interior is substantially at said elevated pressure and when the elevator car door and the last-named elevator shaft door then close and the elevator car moves to a floor substantially at ambient atmospheric pressure, the elevator car interior is depressurized so that said elevator car interior serves as a pressure transition chamber as said elevator car moves between a floor substantially at ambient atmospheric pressure and a floor at said elevated pressure, and said elevator car serves as an air lock inhibiting air flow between locations substantially at ambient atmospheric pressure and locations within said building at said elevated pressure.

4,637,177

MODULAR UNIT ADAPTED FOR OFFICE USE

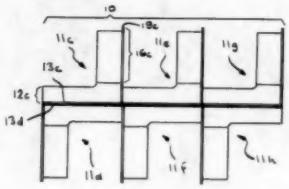
Dennis L. Long, 2524 Santigo S.E., Grand Rapids, Mich. 49506

Continuation of Ser. No. 569,298, Jan. 9, 1984, abandoned, which is a continuation-in-part of Ser. No. 518,480, Jul. 29, 1983, Pat. No. 4,511,024, which is a continuation-in-part of Ser. No. 538,513, Oct. 3, 1983, Pat. No. 4,569,163. This application Oct. 30, 1985, Ser. No. 793,717

The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.

Int. Cl.[4] A47B 5/04

U.S. Cl. 52—36 **10 Claims**



1. A portable and unfoldable first modular unit for office use positioned adjacent to another second modular unit to form the office or positioned adjacent a building wall to form the office with the building wall for providing work stations which comprises:

(a) a central room divider including a solid vertically oriented first wall having opposite ends and

(b) a vertically oriented panel mounted on one of the side closures by hinge means so as to be unfoldable on a vertical axis into an unfolded position at a 90° angle away from a horizontal line between the ends of the central room divider to provide the work station and so as to be foldable 90° on the vertical axis parallel to the horizontal line between the ends of the central room divider to a closed and folded position between the side closures and adjacent the work surface to enclose the cabinet, wherein the hinge means allows the panel to be moved parallel to the vertical axis away from the side closure for repositioning of the panel to the folded position and to allow the panel to be moved towards the side closure to abut against the side closure when unfolded in the open position so as to be continuous with the side closure to provide a second wall of the office and wherein the hinge means provides a square corner with the side closure in the closed and folded position and wherein the vertically oriented panel sides located between the ends and a top and a bottom, a cabinet structure on at least one side of and adjacent the bottom of the wall, side closures mounted at the ends of the central room divider perpendicular to the wall so as to enclose the opposite ends of the central room divider and with a horizontally oriented first work surface mounted on the cabinet on and between the side closures at a level for typing use; is positioned adjacent to the building wall to form the office or wherein the second modular unit with a second room divider, second end closures and second panel is positioned adjacent the first modular unit to form a third wall of the office; and

(c) a second work surface hingedly mounted on the panel with a second hinge means on the second work surface and on the panel so that the second work surface is foldable upward and at a level for typing use when unfolded and with a retaining means engaging the panel and second work surface when the panel is unfolded.

4,637,178

SCREEN ASSEMBLY AND CLIP THEREFOR

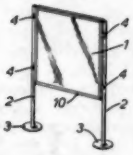
Neil D. Nimmo, Hove; Michael Kenny, and David Willis, both of Kent, all of England, assignors to Nimlok Limited, London, England

Continuation of Ser. No. 528,917, Sep. 2, 1983, abandoned. This application Dec. 7, 1985, Ser. No. 804,221

Claims priority, application United Kingdom, Sep. 3, 1982, 8225122; Aug. 30, 1983, 8322902

Int. Cl.[4] A47B 5/00; E04C 2/00

U.S. Cl. 52—36 **24 Claims**



1. A screen assembly including at least one panel with slots along its side edges, a plurality of upright poles and a plurality of fastening elements which engages the upright poles and fasten the panel to the poles with the panel edges in confronting relationship to the poles, wherein the arrangement of the fastening elements and the panel is such that a foot portion of each fastening element can be inserted into a slot until a base of the fastening element abuts the side edge of the panel and can be rotated in the slot about an axis transverse to the slot, whereupon the foot portion becomes progressively more securely clamped in the slot and in a final position is locked to the panel.

4,637,179

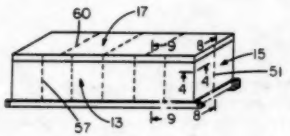
KNOCKDOWN BUILDING

Floyd E. Bigelow, Jr., 10802 Pine Bayou, Houston, Tex. 77024; Floyd E. Bigelow, III, 7903 Midland Forest, Houston, Tex. 77088, and William H. Bigelow, 6903 Oakwood Grove, Houston, Tex. 77040

Filed Feb. 3, 1984, Ser. No. 576,897

Int. Cl.[4] E04H 1/00

U.S. Cl. 52—79.5 **7 Claims**



1. A knockdown building comprising:

a rectangular floor comprising a plurality of spaced wooden structural members and upper and lower sheets of structural material secured to the structural members with a lower surface of said lower sheets providing a bottom of said floor;

side walls comprising:

a plurality of spaced structural members and an inner and outer skin of structural metal secured to the structural members;

a roof comprising:

a plurality of spaced structural members and an inner and outer skin of structural material secured to the structural members,

said outer skin covered with waterproof materials, and

a rectangular skid of angle iron members arranged with the interior side of each angle iron member in engagement with the bottom and a side of said floors;

said angle iron members secured to said floor and secured to each other at the four corners of the floor with one of the angle iron members extending beyond the rectangular skid at each corner of the floor; and

a hole in each extending angle iron member for engagment by a lifting device,

said floor, side walls and roof being flat and having no protrusions extending upwardly from the floor, inwardly or outwardly of the walls or upwardly or downwardly from the roof other than said angle iron members;

permitting said walls to be stacked on said floor and said roof to be stacked on said walls and buildings to be stacked on each other during shipment.

4,637,180

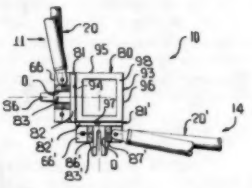
CLIP FOR SELF-LOCKING COLLAPSIBLE/EXPANDABLE STRUCTURES

Theodore R. Zeigler, 9923 Indian Queen Point Rd., Oxon Hill, Md. 20022

Division of Ser. No. 409,435, Aug. 19, 1982, Pat. No. 4,522,008. This application Jun. 10, 1985, Ser. No. 742,867

Int. Cl.[4] B24B 7/00

U.S. Cl. 52—109 **12 Claims**



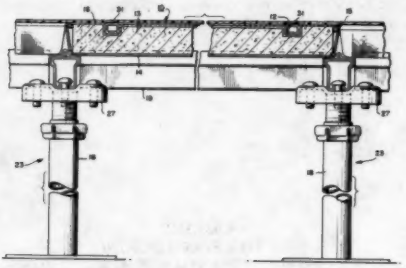
1. A structure comprising a pair of adjacent separate, individual, collapsible and expandable sections, each section being formed of a plurality of pairs of crossed rod elements pivotally interconnected to each other through hubs having openings whereby said sections can be individually collapsed and expanded between two polygonal configurations of respective small and large sizes for respective storage/transport and use, releasable securing means for releasably securing one hub of one section to one hub of another adjacent section when said sections are of expanded large size, said releasable securing means including at least two stems with each stem being interlockingly received in an associated opening of said last-mentioned hubs, said releasable securing means also including a rigid multi-sided supporting element having at least two sides disposed at an angle to one another, first and second bodies each of which has opposite sides, said stems extending from one side of each of said bodies, each stem being at least bifurcated to define a pair of stem portions, each stem having means at the outer and thereof for releasably locking each of the stems to its associated hub by engaging a side of the associated hub remote from the body from which the stem extends, each of said bodies having an opening formed therein, each of said sides on the supporting element having a projection integral with and extending therefom, each of said projections being received within the opening of one of said bodies for locating said bodies such that each side of the supporting element is disposed adjacent the other side of one of said bodies, and bonding means fixedly securing each of said other sides to the adjacent side of the supporting element.

4,637,181

ELEVATED WATERPROOF ACCESS FLOOR SYSTEM AND METHOD OF MAKING THE SAME

Marc M. Cohen, Palo Alto, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,046
Int. Cl.[4] E04S 5/58
U.S. Cl. 52—126.5 10 Claims



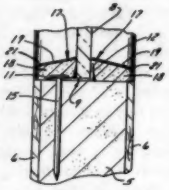
1. An elevated waterproof access floor system that can be opened and subsequently resealed in a waterproof fashion without destroying its aesthetic appearance or the tiles used therein comprising: a support grid, a plurality of tiles supported on said grid, each tile having a recess for receiving an attachment element, a waterproof flooring sheet of heat-resealable material with attachment elements adhered to one surface of said heat-resealable material, said sheet supported on and covering said plurality of tiles with each attachment element mating with a respective tile recess to prevent lateral movement of said sheet with respect to said tiles.

4,637,182

WINDOWED FIRE DOOR

Wendell E. Ellsworth, and Raymond P. Birdsall, both of Green Bay, Wis., assignors to Algoma Hardwoods, Inc., Algoma, Wis.

Filed Apr. 7, 1986, Ser. No. 848,931
Int. Cl.[4] E06B 3/58
U.S. Cl. 52—211 4 Claims



1. A windowed fire door comprising a core of incombustible material that has opposite surfaces, a wood veneer facing overlying and bonded to each of said surfaces of the core, and a rectangular pane of glass exending across a hole through said core and said facings and having opposite flat surfaces that are parallel to and spaced inwardly from the respective facings, said fire door being characterized by:

A. a plurality of L-shaped clips, each having a pair of legs with opposite flat surfaces, said surfaces of the respective legs being perpendicular to one another, and one of said legs having a nail hole therethrough that is spaced from the other leg,

(1) each said clip having its said one leg extending across an edge of said pane and having its said other leg flatwise engaging the surface of the pane that is remote from said nail hole,

(2) each of certain of said clips having its said other leg engaged with one surface of said pane and each of the rest of said clips having its said other leg engaged with the other surface of said pane;

B. a nail through said nail hole of each clip, engaged in said core to secure the clip thereto and thereby confine the pane against displacement relative to the door; and

C. a plurality of framing bead strips, one along each edge of the pane at each surface thereof, each said strip being secured to the core to comprise a seal between the core and the pane, each said strip comprising

(1) an elongated body of high density incombustible mineral material having a pair of adjacent lengthwise extending surfaces, one of which opposes said core and the other of which opposes said pane, and

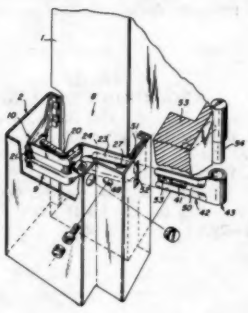
(2) a veneer of wood overlying and bonded to said strip over the other lengthwise extending surface portions thereof.

4,637,183

FRAME FOR DOOR OR WINDOW OPENING

Laurens Metz, Hilversum, Netherlands, assignor to Polynorm, N.V., Netherlands

Filed Oct. 12, 1984, Ser. No. 660,221
Claims priority, application Netherlands, Oct. 13, 1983, 8303519; Dec. 21, 1983, 8304390; Dec. 21, 1983, 8304391
Int. Cl.[4] E06B 1/04
U.S. Cl. 52—217 8 Claims



1. A frame comprising:

a steel frame element having a substantially u-shaped cross-section, a first opening means, at least one other opening means and two flanged rim means for clamping a wall in between the flanged rim means;

at least one clamping device having steel clamping jaws positioned within said frame element, one of said jaws being provided with a paumelle fastening means;

clamping means for connecting said clamping jaws;

said clamping jaws having a substantially ridge and gutter shaped profile along the longitudinal direction of the clamping jaws, said clamping jaws engaging said flanged rim means;

at least one paumelle having a wing portion thereon which is provided with a paumelle fastening means, along said wing portion, for attaching said wing with one of said clamping jaws, said wing being engaged with said clamping jaws through said first opening means, said wing shaped so as to securely fit within the ridge and gutter shape of said clamping jaw; and

a single screw bolt means being passed through said other opening means, for attaching said wing to one of said clamping jaws.

4,637,184
HOLLOW FLOOR

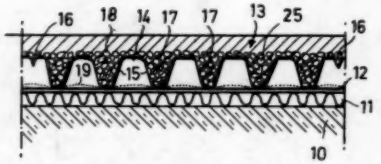
Wolfgang Radtke, Nachtigallenweg 46, D-5063 Steinenbrück; György Borbely, Schaevenstr. 6, D-5014 Kerpen-Mödrath; Sebald Pallhorn, AM Geisberg 30, D-8752 Goldbach, and Erich Höllfritsch, Rainwiesenweg 21, D-8501 Behringersdorf, all of Fed. Rep. of Germany

Continuation of Ser. No. 343,309, Jan. 27, 1982, abandoned. This application Jul. 10, 1985, Ser. No. 754,194

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103632

Int. Cl.[4] **E04F** *15/02;* **E04B** *5/48;* **E04G** *11/04*

U.S. Cl. 52—220 **22 Claims**



1. A hollow floor system, comprising:

a floor bottom,

a plastic mold emplaced atop said floor bottom, said mold having a plurality of integral feet and having planar portions of flexible sheet material extending between and interconnecting said feet, wherein each foot of the mold has continuous, closed side and bottom walls, each of said foot side walls having a smooth exterior,

a flowable, hardenable substance poured into said mold, the weight of said substance bringing all of said feet into contact with said floor bottom, said planar portions of flexible sheet material permitting adjacent feet to yield under the weight of said substance to thereby enable each of said bottom walls of said adjacent feet to contact said floor bottom even in the event that said floor bottom is uneven,

said substance when hardened thereby forming a hollow floor having a floor top supported by plural spaced load bearing legs within said mold feet, there being a hollow cavity between said floor bottom and said floor top in the regions between said legs.

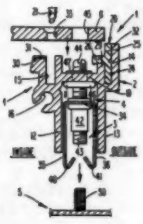
4,637,185
TRENCH DUCTS

Timothy S. Bowman, Parkersburg, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jun. 18, 1984, Ser. No. 621,957

Int. Cl.[4] **E04B** *5/48*

U.S. Cl. 52—221 **21 Claims**



1. A side rail for use in a trench duct wherein the side rail extends horizontally:

an elongated upper section comprising a horizontally extending upper bridge having a plurality of clearance openings serially spaced therealong, a pair of spaced apart upper legs extending downwardly from the upper bridge, and means to support a trench duct cover above the upper bridge;

an elongated lower section comprising a horizontally extending lower bridge disposed below said upper bridge, a pair of spaced apart lower legs extending downwardly respectively adjacent said upper legs and each terminating by an inwardly extending bend with the bends facing one another and forming a stud gripping means;

a plurality of adjusting nuts connected to and serially spaced along said lower bridge;

a plurality of adjusting screws respectively disposed in said adjusting nuts and extending upwardly through said clearance openings, each screw having a slot in the upper end to receive a turning tool and having a support flange engaging the under side of said upper bridge to thereby support said upper section; and

for at least some of said screws, means holding the upper bridge firm against said support flange.

4,637,186
FENCE POLE

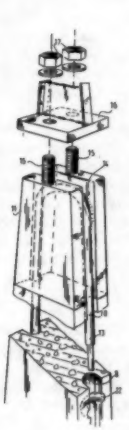
Franciscus B. M. Ruigrok, Son, Netherlands, assignor to Heras Holding, B.V., Oirschot, Netherlands

Continuation of Ser. No. 440,718, Nov. 10, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,597

Claims priority, application Netherlands, Nov. 11, 1981, 8105107

Int. Cl.[4] **E04C** *3/26;* **E04H** *17/14*

U.S. Cl. 52—225 **18 Claims**



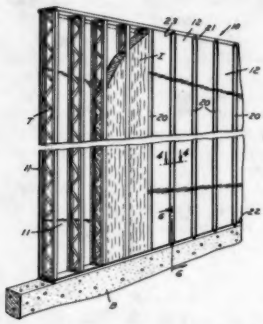
1. A fence post construction comprising an elongate body of cured concrete, said body having opposite side faces, said body being double tapered so that the width thereof between the opposite side faces increases from one end of the body to an intermediate portion thereof and then decreases to an end opposite said one end of the body, a first rigid end member engaged against said one end of the body and a second rigid end member engaged against the opposite end of the body, external tensioning means having one run engaging one of said side faces and another run engaging the other of said side face for holding said end members against the respective ends of the body and securing means holding said tensioning means in tensioned condition for placing the cured concrete of said body under longitudinal compression between said end members and for pressing said runs upon said body to place the cured concrete of said body under transverse compression between said runs.

4,637,187

PREFABRICATED BUILDING PANELS

Henry F. Campbell, 9301 Michigan Ave., Detroit, Mich. 48210

Filed Aug. 2, 1985, Ser. No. 761,913
Int. Cl.[4] E04B 1/74
U.S. Cl. 52—404 15 Claims



1. A prefabricated building panel comprising

a plurality of longitudinally extending transversely spaced trusses,

each truss comprising opposed bases and an intervening portion extending between the bases,

a first sheet and a second sheet fastened to one of said bases,

insulating material between said sheets,

said first sheet comprising a plurality of transversely spaced grooves defined by transversely spaced narrow ribs extending longitudinally and formed by closely spaced portions of the first sheet bent inwardly,

said grooves having a base wall and a side wall width substantially equal to the width of one of the bases of the truss and receiving one of the bases,

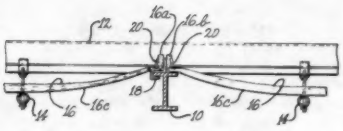
the base of each groove lying in the plane of the sheet and the width of said ribs being substantially less than the width of said grooves such that the overall appearance of the exterior of said first sheet appears to be planar and substantially uninterrupted except for narrow lines defined by the space between the closely spaced portions of the ribs and such that the space between adjacent bases is maximized for receiving insulating material.

4,637,188

SPLICING MEANS FOR FACED INSULATION BATTS

Steven D. Crothers, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 28, 1986, Ser. No. 834,725
Int. Cl.[4] E04B 1/74
U.S. Cl. 52—404 2 Claims



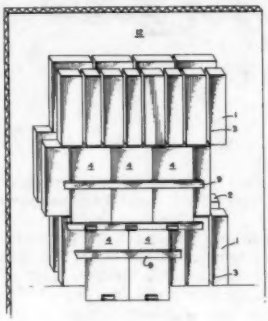
1. In a roof/ceiling insulation system for a metal building wherein a plurality of spaced parallel purlins are supported by and extend perpendicularly to a plurality of spaced parallel I-beams, spaced parallel insulation supporting tubes are suspended from the purlins and extend parallel to the main beams, and faced fibrous insulation batts are strung over the insulatin supporting tubes and main beams, means for splicing adjacent ends of two of the insulation batts together above one of the main beams and securing said ends with respect to said one main beam, said splicing means comprising a push-on splicing member mounted on an upper flange portion of said one main beam and presenting a flat backing portion extending vertically upwardly therefrom, and a pair of clamping strips respectively securing said ends of the insulation batts to opposite sides of said backing portion.

4,637,189

THERMAL INSULATION SYSTEM

Wilhelmus A. Maria van Riet, Nieuw Beijerland, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 25, 1985, Ser. No. 704,829
Claims priority, application Netherlands, Feb. 24, 1984, 8400584
Int. Cl.[4] E04H 7/00
U.S. Cl. 52—309.8 10 Claims



1. An insulation system suitable for insulating a storage tank having a curved surface without using screws, which comprises a thermal insulation layer of a plurality of interconnecting insulation elements, each insulation element being generally rectangular in shape and having at least one guide groove provided in a major surface of the insulation element or formed at a joint of two adjacent elements, a plurality of individual insulation elements are arranged to provide an interconnecting network of insulative elements forming said insulation layer, and a protective layer covering the insulation layer, said protective layer comprising a plurality of sheet elements which are generally rectangular in shape, each sheet element having a flange at one end and a grooved flange at the opposite end; said grooved flange being designed such that when two insulation elements are interlocked together by the sheet element, the flange of one sheet element fits into the grooved flange of a second sheet element and the grooved flange fits into the guide groove of the insulation element; at least one fastening strap securing the insulation and sheet elements; and wherein the grooved flange of the sheet element is closed at one end; the closed end being inclined whereby water will flow outwardly from the grooved flange.

4,637,190

BUILDING PANEL

Gerrard O. Minialoff; Martin J. Minialoff, and Andrew J. Minialoff, all of Box 107, R.R. #1, Kleinberg, Ontario, Canada (L0J 1C0)

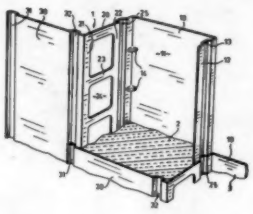
Filed Jul. 12, 1984, Ser. No. 630,137
Claims priority, application Canada, Jul. 15, 1983, 432513
Int. Cl.[4] E04C 1/10
U.S. Cl. 52—579 10 Claims

1. A building panel formed from a single sheet of material and comprising:

an outer panel portion, which is generally planar and in-

cludes a first coupling channel extending adjacent a free edge of the outer panel portion with a second coupling channel extending parallel to the first coupling channel adjacent an opposite edge of the outer panel portion, which first and second coupling channels have complementary shallow, trapezoidal cross-sections, to enable a first coupling channel to fit within a second coupling channel;

an inner panel portion, adapted to be overlaid by an outer panel portion, which inner panel portion is generally planar and includes a third coupling channel; and



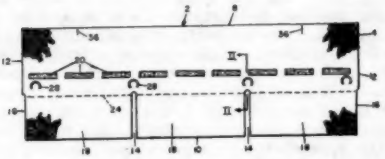
a web portion extending between the inner and outer panel portions and including a fourth coupling channel extending parallel to the third coupling channel adjacent an opposite edge of the inner panel portion, the third and fourth coupling channels having complementary shallow, trapezoidal cross-sections, to enable a fourth coupling channel to fit within a third coupling channel, whereby, in use, a surface of a building can be formed from a plurality of said panels disposed adjacent one another with adjacent inner and outer panel portions overlying one another and with the coupling channels engaging one another.

4,637,191

STARTER SHINGLE

Robert L. Smith, 303 E. Bridge St., Blackwell, Okla. 74631

Filed Dec. 3, 1984, Ser. No. 677,586
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—522 **2 Claims**



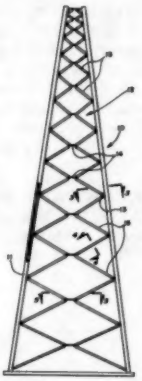
1. A starter shingle comprising a generally rectangular sheet of shingle material having top, bottom and side edges, said sheet having a series of vertical slots formed therein at generally regular intervals across its width, said slots extending normally from said bottom edge to a height less than one-half of the distance between said top and bottom edges and dividing the lower edge portion of said shingle into a series of downwardly extending tabs, said sheet having a strip of heat-sensitive adhesive applied to the top surface thereof along a line parallel to the top and bottom shingle edges and adjacent but spaced above the closed upper ends of said slots, said shingle being deeply scored along a line parallel to the top and bottom edges thereof and generally at the closed upper ends of said slots, said shingle being easily and accurately breakable along said score line whereby to facilitate separation of said tabs from the remainder of the shingle to leave a starter shingle, a series of said starter shingles being adapted to be secured to a sloping roof deck in side-to-side abutting relation at the eave edge of said deck to form a starter course of shingles above which a series similarly slotted standard shingles may be applied in successively upwardly offset courses with the lower edge of the lowermost course of standard shingles also being flush with the eave edge of the roof deck, said starter course providing a continuous, unslotted shingle layer beneath the slotted edge portion of the first course of standard shingles to prevent leakage of water through said slots to said roof deck, the separated tabs being usable to simulate a final topping-out course of shingles adjacent a ridge of the roof.

4,637,192

TELESCOPING SUPPORT STRUCTURE

Wendell E. Brown, 255 E. 100 South, St. George, Utah 84770

Filed Jun. 21, 1985, Ser. No. 747,417
Int. Cl.[4] E04H *12/18*
U.S. Cl. 52—632 **55 Claims**



1. A support structure including, as a lattice structure, a flat plate assemblage of nested components that include outside and intermediate gusset plates with braces extending therebetween, the braces to bend or rotate at their junctions with the respective gusset plates, when a force is applied to said assemblage to telescope that assemblage apart forming tiers, each tier involving sides where the outside gusset plates are shared between tiers with an intermediate gusset plate arranged therebetween on a bias angle across each tier side, the braces each secured at their ends between on a bias angle across each tier side, the braces each secured at their ends between an outside gusset plate and an intermediate gusset plate; means for telescoping apart the flat plate assemblage of components; means for establishing and maintaining the spacing of the adjacent outside gusset plates providing for the erecting of the assemblage to a predetermined height that includes at least three straight corner members that are bent longitudinally to accommodate individual outside gusset plate edges therebetween; and means for securing each outside gusset plate at a location to a straight corner member to provide said desired outside gusset plate spacing.

4,637,193

CONNECTING APPARATUS

Fredric A. Lange, Osseo, Minn., assignor to Interlock Structures International, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 590,738, Mar. 16, 1984, abandoned. This application Mar. 15, 1985, Ser. No. 712,229
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—648 **15 Claims**

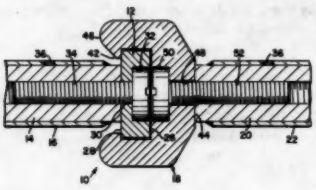
2. Connecting apparatus, comprising:

a tube having opposite first ends;

a cylindrical rod having a second end, said rod being fastened in one of said first ends of said tube;

a cylindrical button attached to said second end of said rod, said button having a first diameter greater than said rod;

means for receiving said button, said receiving means being attached to a structural member, said receiving means including a block having a cylindrical wall with first and



second ends, said block having a second diameter greater than said button, said block having a cavity extending inwardly from the cylindrical wall, said cavity having a semi-cylindrical end coaxial with said block, said block having a slot in the first end for receiving said rod as said cavity receives said button, said slot having a width less than the first diameter of said button.

4,637,194

WOOD BEAM ASSEMBLY

James Knowles, 1275 Club Dr., Bloomfield Hills, Mich. 48013

Filed Dec. 10, 1985, Ser. No. 807,294

Int. Cl.[4] E04C *3/02*

U.S. Cl. 52—690 **10 Claims**

1. A wood beam assembly for use as a joist and the like, comprising:

a pair of horizontally arranged wood chord members interconnected by a narrower wood web member to form a generally I-beam shaped cross-section;

shear stress plates applied upon the web at each of the opposite ends of the beam and covering the area of maximum shear stress which is located adjacent the beam ends;

the wood chord members and the web each being of substantially uniform cross-section throughout their lengths wherein the opposite ends of the web are thickened by the shear stress plates applied thereon;

and means securely fastening the chords to the web and the shear stress plates to the web, said means for fastening comprising U-shaped wire staples having legs interconnected by a bight with a center line axis extending between and parallel to the legs, the free ends of the legs being beveled at acute angles inwardly towards the center line axis of the staple and away from the bight of the U-shape, so that the legs are shorter along their external edges that are remote from the center line axis of the U-shapes, said staple legs being additionally chamfered at the outermost edges of their bevels relative to the central axis of the staples;

said staple legs crossing the center line axis due to the leg ends tending to move towards and past each other as they are forced longitudinally into the wood during application of the staples for fastening.

4,637,195

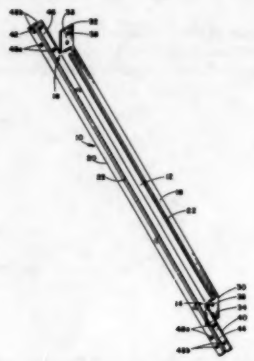
REINFORCING MEMBER FOR WOODEN STRUCTURE

Roy E. Davis, 2215 Albert St., Anderson, Ind. 46012

Filed Dec. 16, 1985, Ser. No. 809,314

Int. Cl.[4] E04C *3/32*

U.S. Cl. 52—693 **4 Claims**



1. A structural reinforcing member for bracing studs at adjacent spaced locations within a frame of a building wall or the like, said member being comprised of an elongated, generally straight body portion having stud mounting portions at distal ends thereof; said body portion being comprised of first and second planar sections forming a generally L-shaped configuration of said body portion, the width of said first planar section being less than the width of a stud to be mounted at either end of said structural member, said planar sections of said body portion having ends forming said mounting portions; the ends of said first planar section being disposed obliquely with respect to said first planar section, parallel with respect to each other, and in opposite directions with respect to each other, said ends thereby forming outwardly facing, generally flat first mounting surfaces for engagement with opposed faces of adjacent spaced studs, said first mounting portions having apertures through which fasteners may be engaged; the ends of said second planar section forming coplanar extensions thereof, each extension being of a predetermined length greater than the combined thickness of studs found at the spaced location to be mounted thereby; said extensions providing second mounting surfaces in a plane perpendicular to said first mounting surfaces, each second mounting surface being substantially equal in length to said combined stud thickness at said spaced location to be mounted thereby, each second mounting surface having apertures through which fasteners may be engaged; and said extensions being deformable to wrap around said studs such that third mounting surfaces are thereby provided in a plane perpendicular to said second mounting surfaces and parallel to said first mounting surfaces, said third mounting surfaces having apertures through which fasteners may be engaged.

4,637,196

MACHINE HOUSING

Erwin Berner, Waiblingen, and Hans-Dieter Zettel, Waiblingen-Beinstein, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 646,994

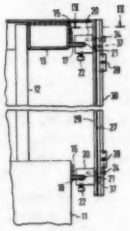
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337218

Int. Cl.[4] B65B *57/00*

U.S. Cl. 53—77 **9 Claims**

1. In a machine housing having a frame (11) and wall portions (25, 26) the improvement comprising at least a pair of horizontally disposed vertically spaced angle brackets (17, 18)

having offstanding edge portions (21), clamping elements (20) for each said vertically spaced angle bracket provided with slot means adapted to receive said offstanding edge portions of said angle brackets, perforated strut means (29) interconnecting said vertically spaced clamping elements and positioned



perpendicularly thereto, at least one perforated support strip (27) adapted to support said wall portions, means to attach said support strip to said strut means, and bolt means to releasably secure said support strip and said strut means to said clamping elements.

4,637,197

METHOD AND COMPOSITIONS FOR REMOVAL OF MOISTURE

Charles E. Banfield, Nashua, N.H., assignor to Epoxy Technology, Inc., Billerica, Mass.

Continuation of Ser. No. 660,750, Oct. 15, 1984. This application Dec. 26, 1985, Ser. No. 814,572

Int. Cl.[4] B65B *55/00*

U.S. Cl. 53—428 **22 Claims**

1. A method for absorbing moisture within a moisture-sealed enclosure surrounding an article, the method comprising the steps of

A. mixing a curable epoxy resin with a quantity of an independent curing agent sufficient for curing said resin and an effective amount of an anhydride of a monocarboxylic acid for absorbing moisture,

B. applying said mixture of said resin, curing agent and anhydride to said article, and

C. sealing the enclosure to exclude moisture from entering therein.

7. A method for packaging electronic devices in substantially moisture-free packages, the method comprising the steps of

A. securing the device within the package with a moisture-absorbing epoxy composition comprising a curable epoxy resin, an independent curing agent and an effective amount of an anhydride of a monocarboxylic acid, for absorbing moisture, and

B. sealing the package to exclude moisture from entering therein.

17. A moisture-absorbing composition comprising

A. a curable epoxy resin,

B. a quantity of an independent curing agent sufficient for curing said epoxy resin, and

C. an effective quantity of an anhydride of a monocarboxylic acid for absorbing moisture.

4,637,198

METHOD AND APPARATUS FOR TEMPORARILY STORING PRINTED PRODUCTS ARRIVING IN AN IMBRICATED FORMATION

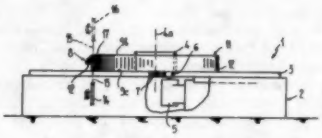
Walter Gerber, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jun. 23, 1986, Ser. No. 877,130

Claims priority, application Switzerland, Jul. 1, 1985, 02930/85

Int. Cl.[4] B65B *63/04*

U.S. Cl. 53—430 **34 Claims**



1. A method for the intermediate storage of printed products arriving in an imbricated formation, comprising the steps of:

winding the imbricated formation up to form a wound product package on a rotatably driven winding core about an upright winding axis of said winding core; and

depositing the printed products upon a support structure which rotates conjointly with the winding core, with the lowermost edges of the printed products extending substantially transverse to said upright winding axis of said winding core.

4,637,199

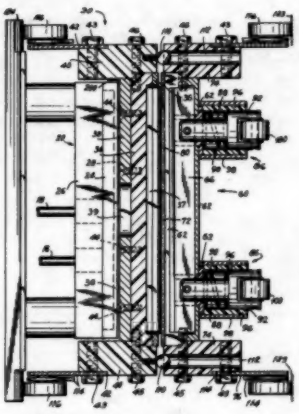
INDUCTION SEALING OF PAPERBOARD

Robert F. Steck, Bensalem, and John L. Baartman, III, Lansdale, both of Pa., assignors to International Paper Company, New York, N.Y.

Filed Jan. 30, 1985, Ser. No. 696,519

Int. Cl.[4] B65B *9/08, 9/22*

U.S. Cl. 53—451 **10 Claims**



1. A method of sealing packaging material having a layer of thermoplastic material and a layer of electrically conductive material comprising:

(a) compressing the packaging material together between first and second rigid members so that a first thermoplastic material portion is pressed against a second thermoplastic material portion with no relative motion between the first and second rigid members and the first and second thermoplastic material portions, the first and second rigid

members being electrically isolated from ground and the first rigid member having an electrically conductive material on its surface which contacts the packaging material and which is in the form of a first loop and also having a second electrically conductive material in the form of a second loop, said first and second loops being separated by a rigid, nonconductive material;

(b) generating a primary electromagnetic field having an effective range for inducing a current in an electrically conductive material brought within the effective range;

(c) inducing from said primary electromagnetic field a first current in the second electrically conductive material loop of the first rigid member by moving the first rigid member into the effective range of said primary electromagnetic field thereby generating a second electromagnetic field from the first current flowing in the second electrically conductive loop of the first rigid member,

(d) inducing from the second electromagnetic field of the second loop a second current in the first loop thereby generating a third electromagnetic field;

(e) fusing the first and second thermoplastic material portions together by inducing from the third electromagnetic field of the first loop a third current in said electrically conductive material layer of the packaging material for a period of time sufficient to generate enough heat as a result of the induced current flow to soften and fuse together the first and second thermoplastic material portions without adversely affecting the packaging material and;

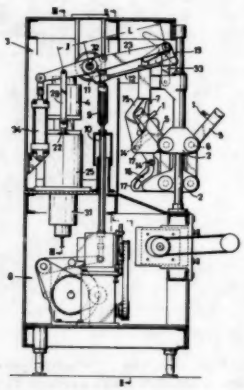
(f) solidifying the heated thermoplastic material into an effective seal after it fused together by removing the first rigid member from the effective range of the first electromagnetic field so that no significant induced currents flow, no heat is generated, and the thermoplastic material is allowed to cool and harden.

4,637,200

CONTAINER FORMING APPARATUS FOR PACKAGING MACHINE

Masato Shibata, Tokushima; Mamoru Eguchi, and Yoshihito Kondo, both of Naruto, all of Japan, assignors to Shikoku Kakooki Co., Ltd., Tokushima, Japan

Filed Oct. 18, 1984, Ser. No. 661,989
Claims priority, application Japan, Oct. 18, 1983, 58-195101
Int. Cl.[4] B65B *9/06*
U.S. Cl. 53—551 **4 Claims**



1. A container forming apparatus for a packaging machine by which a vertical tube filled with contents is sealed over a required width at a spacing corresponding to the length of one container and is cut at the midportion of the seal width, the apparatus comprising:

an apparatus frame provided with a vertical guide rod, a horizontal pin disposed laterally of the vertical guide rod, and a horizontal rotary axis arranged between the vertical guide rod and the horizontal pin in the horizontal direction and disposed above and parallel to the horizontal pin in the vertical direction;

a slide having forming jaws and movable upward and downward along the vertical guide rod;

a balance cylinder pivotally supported by the horizontal pin at its lower portion and provided with a piston rod possessing a force proportional to the weight of the slide with reciprocally movable parts mounted thereon;

a pivotal arm suspending the slide through a connecting rod at its one end and connected to the piston rod of the balance cylinder at its other end, the pivotal arm being supported at a point between its opposite ends by the horizontal rotary shaft; and,

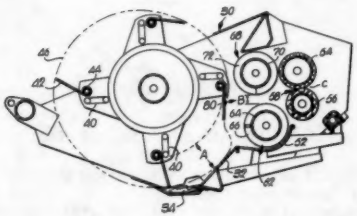
a means mounted on the apparatus frame, for turning the pivotal arm so as to lift the frame.

4,637,201

WIDE-CUT WINDROWER-CONDITIONER HAVING UNIFORM CROP DISTRIBUTION AND CONDITIONING

Martin E. Pruitt, Hesston; Cecil L. Case, and David P. Fritz, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jul. 24, 1984, Ser. No. 633,933
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—16.4 **14 Claims**



13. In a crop harvester:

means for moving severed crop materials along a path of travel toward a point of discharge;

a pair of vertically spaced-apart, transverse augers between said moving means and the point of discharge within said path of travel of the crop materials; and

means for driving said augers in such mutually opposite rotative directions as to cause the augers to receive the crop materials from said moving means, distribute the materials axially inwardly along their mutually opposed, peripheral surfaces, and deliver the distributed materials to said discharge point.

4,637,202

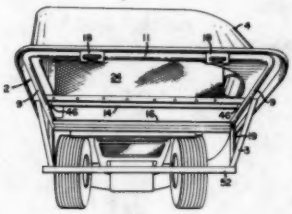
LAWN MOWER GRASS COLLECTOR BAG SUPPORT

Gary R. Lamusga, Prior Lake, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Apr. 30, 1984, Ser. No. 605,329
Int. Cl.[4] A01D *35/22*
U.S. Cl. 56—16.6 **14 Claims**

12. An improved lawn mower of the type having a mower body that includes a housing in which grass is cut, a chute having one end connected to the housing for conveying grass clippings away from the housing, the chute having its other end connected to a grass directing hood mounted on the mower body, and bag support means for supporting at least one grass bag beneath the hood for receiving grass clippings therefrom, wherein the improvement relates to the bag support means and comprises:

(a) a bag frame from which the grass bag is suspended with the bag frame having an open, cross-sectional area that defines an open upper end of the grass bag, wherein the bag frame is resilient and includes means for selectively contracting the cross-sectional area thereof from a first normal sized area to a second smaller sized area; and



(b) framework means for supporting the bag frame beneath the hood when the bag frame has its normal sized cross-sectional area and for releasing the bag frame for removal and dumping of the bag when the bag frame has its smaller sized cross-sectional area.

4,637,203

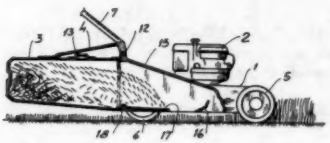
GRASS SHAVING MACHINE

Luisa Fedeli, Via dei Gracchi, 26, 20146-Milano, Italy

Continuation of Ser. No. 628,243, Jul. 6, 1984, abandoned. This application Jul. 25, 1985, Ser. No. 758,952

Int. Cl.[4] A01D *35/22*

U.S. Cl. 56—202 **5 Claims**



1. A grass mowing machine comprising a frame, an engine supported by the frame, a casing having a lowermost edge and being supported by said frame, said casing housing at least one grass cutting blade rotatable around an axis perpendicular to the ground, said casing being open at the bottom and being in communication with the cut grass, a conveyor duct for conveying the cut grass, said conveyor duct having an outlet and an enlarged cross-section at said outlet thereof, a vessel for collecting the cut grass at the rear of said casing, said vessel having an inlet, said vessel being located with its inlet at the outlet of said conveyor duct, the bottom portion of said conveyor duct being formed at least partially of a movable wall mounted at the lower portion of said

casing at the rear and the top of said casing and being tiltable towards the inlet of said vessel, said movalbe wall having a perimetrical contour fitting said conveyor duct whereby said movable wall pushes grass in said conveyor duct into said vessel when said movable wall is rotated toward said inlet of said vessel, and wherein said movable wall is located substantially at the level of said lowermost edge of said casing and being parallel to the ground whereby it closes said conveyor duct during the grass cutting operation, and is tiltable to be arranged vertically, in a tilted position, during the cut grass discharging operation, said movable wall being rotatable upwardly and rearwardly to said tilted position.

4,637,204

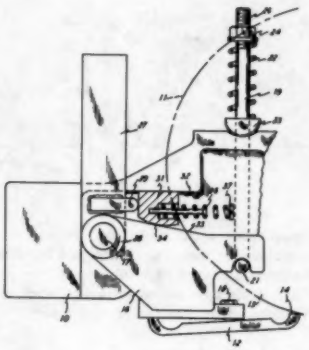
LAWN MOWER BEDKNIFE ADJUSTMENT

Terrance G. Benson, Union Grove, Wis., and Dean M. Lewis, Cedar Falls, Iowa, assignors to Textron Inc., Providence, R.I.

Filed Jan. 11, 1985, Ser. No. 690,738

Int. Cl.[4] A01D *55/32, 55/20*

U.S. Cl. 56—249 **9 Claims**



1. In a lawn mower having cutting members consisting of a rotatable reel and a bedknife, both having cutting edges thereon, and with one of said cutting members being movable toward and away from the other of said cutting members for adjusting the clearance between the cutting edges, and the mower having a frame, the improvement comprising a spring operative between said frame and said one of said cutting members for yieldingly urging said one of said cutting members toward said other of said cutting members, said mower having a ramp surface, a connecting member connected with said one of said cutting members and being movable therewith and being spaced from said ramp surface on said mower frame, and with said connecting member and said ramp surface defining a wedge-shaped space therebetween, and with the size of said wedge-shaped space being determined by the movement of said connecting member relative to said surface, a movable wedge disposed within said wedge-shaped space for limiting movement of said one of said cutting members in the direction toward said other of said cutting members, to influence the clearance between said cutting edges, and a spring connected with said wedge for yieldingly urging said wedge into said wedge-shaped space.

4,637,205

SPLICER DEVICE FOR THE MECHANICAL SPLICING OF TEXTILE YARNS

Roberto Badiali, Pordenone; Luciano Bertoli, Salo' , and Claudio Speranzin, Pordenone, all of Italy, assignors to Officine Savio SpA, Pordenone, Italy

Filed Sep. 17, 1984, Ser. No. 651,333

Claims priority, application Italy, Oct. 4, 1983, 83469 A/83

Int. Cl.[4] B65H *69/06;* **D01H** *15/00*

U.S. Cl. 57—22 **70 Claims**

1. An improved splicer device for the mechanical splicing of textile yarns wherein splicing is accomplished by coupling two single untwisted yarns, said splicer device comprising:

plate means comprising two opposed plate members movable toward and away from each other, having untwist-retwist ring means that cooperate at least momentarily with retwist means, said ring means and said retwist means having facing working surfaces;

yarn coupling means;

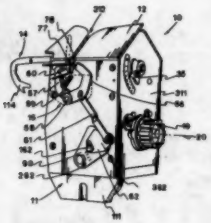
means to balance twists in excessive tail ends;

means to pluck and/or tear excessive tail ends of yarn and thereby leave a small tail, said means acting directly along

the axis of said tail ends, said means comprising a stationary portion and a movable portion for engaging the yarn;

means for clamping the twists in the segments of yarn that are not to be torn;

means for bringing the small tails of yarn in the vicinity of adjacent whole yarns;



inner clamp means to act on the two yarns;

first adjustable cam means to control the movement of said plate members toward each other; and

second adjustable cam means to control the movement of said plate members away from each other.

4,637,206

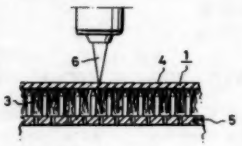
FUR-SKIN STRIP MATERIAL AND METHOD FOR PRODUCING THE SAME

Teruko Suwa, 20-1, Sendagaya 1-chome,, Shibuya-ku, Tokyo, Japan

Filed Apr. 9, 1985, Ser. No. 721,479

Int. Cl.[4] A14B *15/10*; D02G *3/06*; A41H *41/00*

U.S. Cl. 57—31 4 Claims



1. A method for producing narrow, leather strips with fur on one side from animal skins having a leather side and a fur side useful in the production of fur yarns made from twisted fur-skin strips comprising the steps of:

(a) placing a fur-skin on numerous upright needles of a skin holding device such that the fur side of said fur-skin faces downward and the leather side of the fur-skin faces upward so as to make the surface of the leather side substantially flat; and

(b) cutting said fur-skin into a plurality of strips by irradiating the leather side of said fur-skin with a moving laser beam under conditions whereby said laser beam cuts the leather of said fur-skin but does not substantially cut fur on the fur-side of said fur-skin.

4,637,207

PNEUMATIC SPINNING METHOD AND PNEUMATIC SPINNING DEVICE

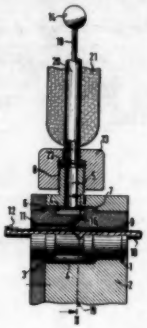
Josef Dericks, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed May 16, 1985, Ser. No. 735,075

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418322

Int. Cl.[4] D02G *1/16, 3/22*

U.S. Cl. 57—282 8 Claims



1. Pneumatic spinning method, which comprises conducting sliver formed at least partly of spinning fibers through at least one swirl nozzle, contacting the sliver in the swirl nozzle with at least one heated compressed air jet operating the swirl nozzle, and imparting a twist to the fibers in the swirl nozzle with at least one heated compressed air jet.

4,637,208

HYDRAULIC ASSISTANCE DEVICE FOR BRAKING

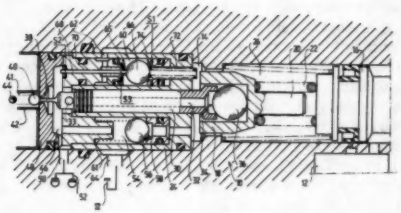
Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Apr. 17, 1985, Ser. No. 724,142

Claims priority, application France, Apr. 26, 1984, 84 06583

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 10 Claims



1. A hydraulic assistance device including a casing provided with a bore in which a first piston is mounted so as to slide and be capable of moving under the effect of a brake pedal between a first position in which a first chamber which is joined to brakes of a vehicle is isolated from a high pressure source of fluid and a second position in which the first chamber communicates with the high pressure source, the device including a second chamber formed in the casing, a first passage joining the first and second chambers and first valve means in the first passage so that the passage is normally closed under the effect of pressure in the first chamber, characterized in that the device includes a second passage permitting the second chamber to communicate with a low pressure reservoir and second

valve means disposed in the second passage, the second valve means being sensitive to pressures in the first and second chambers so that the second passage normally remains closed during operation of the device but allowing fluid to pass from the second chamber toward the reservoir during release of braking, the device including a sleeve in the bore to separate the first chamber from the second chamber and which includes two bores which comprise the first and second passages each associated with a respective one of the valve means.

4,637,209

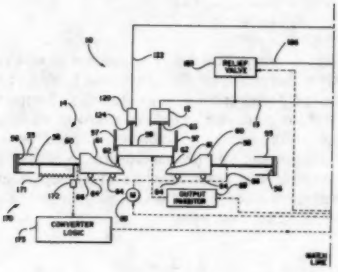
FLUID DRIVEN POWER PLANT

Garry E. Clark, 801 Pierce Rd., Red Oak, Tex. 75154

Continuation-in-part of Ser. No. 514,167, Jul. 15, 1983, Pat. No. 4,541,243, which is a continuation-in-part of Ser. No. 266,933, May 26, 1981, Pat. No. 4,459,084. This application Aug. 19, 1985, Ser. No. 766,937

Int. Cl.[4] F02B *71/04*

U.S. Cl. 60—595 **22 Claims**



1. A fluid-driven power plant, comprising:

fluid handling means containing a substantially constant system volume of fluid under pressure, said fluid handling means comprising:

an output cylinder including an output piston capable of a fill stroke and an output stroke;

a balance cylinder in fluid communication with said output cylinder;

means for operating said balance cylinder to deliver fluid to said output cylinder during said fill stroke;

means for operating said output cylinder to deliver fluid therefrom;

an accumulator in fluid communication with said output cylinder, the operating pressure level of said accumulator being higher than the pressure within said balance cylinder;

a compression acceleration cylinder in fluid communication with said accumulator and including an acceleration piston linked to said output piston: and

a fluid-driven motor having a port in fluid communication with said accumulator;

said compression acceleration cylinder assisting said balance cylinder during said fill stroke.

4,637,210

SUPERCHARGE PRESSURE CONTROL APPARATUS OF A SUPERCHARGED ENGINE

Wataru Yamamoto, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Aug. 28, 1985, Ser. No. 770,531

Claims priority, application Japan, Aug. 31, 1984, 59-181790

Int. Cl.[4] F02B *37/12*

U.S. Cl. 60—602 **1 Claim**

1. A supercharge pressure control apparatus for a supercharged engine, comprising:

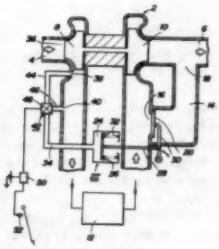
a supercharger turbine associated with an exhaust passage of the engine;

a supercharge compressor associated with an intake passage of the engine for compressing a gas which is supplied through the intake passage to the engine, the compressor being driven by the turbine;

bypass means associated with said exhaust passage for selectively permitting some of the exhaust gasses discharged from the engine and flowing through the exhaust passage to bypass the turbine, said bypass means including a bypass passage communicating with the exhaust passage for bypassing the turbine, and a bypass valve for controlling the opening and closing of the bypass passage;

actuator means for controlling the opening and closing of said bypass valve, said actuator means including means associated therewith for normally maintaining said bypass valve in a closed position, said actuator means also including pressure responsive means for responding to the pressure of the gas in the intake passage for effecting selective opening of said bypass valve;

first means for sensing the pressure of the gas in the intake passage at a first location disposed a substantial distance downstream of said compressor for activating said actuator means to effect opening of said bypass valve when the



pressure in said intake passage at said first location exceeds a preset level;

second means for sensing the pressure of the gas in the intake passage at a second location which is upstream a substantial distance from said first location but is disposed downstream of but closely adjacent to said compressor for activating said actuator means to effect opening of said bypass valve when the pressure at said second location exceeds said preset level, the pressure in said intake passage at said second location being lower than the pressure in said intake passage at said first location; and

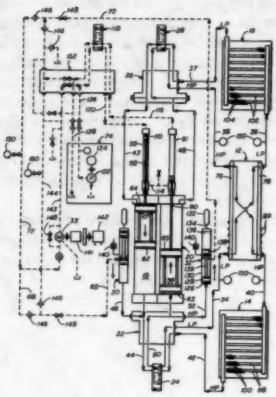
switching means for permitting said actuator means to be controlled by either said first sensing means or said second sensing means, but not by both at the same time; and

control means for controlling said switching means so that said first sensing means communicates with said actuator means during a stable operational state of the engine and said second sensing means communicates with said actuator means during an accelerating operational state of the engine, said control unit including timing means associated therewith for permitting said second sensing means to control said actuator means for only a predetermined time interval, following which said switching means is automatically activated for causing the actuator means to again be controlled by said first sensing means.

4,637,211
APPARATUS AND METHOD FOR CONVERTING THERMAL ENERGY TO MECHANICAL ENERGY

Dowell White, Pasadena; Daniel L. Craig; Jack L. Duke, both of Houston, and Donald H. Laurie, Porter, all of Tex.

Filed Aug. 1, 1985, Ser. No. 761,600
Int. Cl.[4] F01K 25/02
U.S. Cl. 60—650 42 Claims



1. In a heat engine having a liquid working fluid which remains in a liquid state throughout a complete cycle of the engine;

a heat exchanger having a low pressure liquid inlet and a low pressure liquid outlet for low pressure working fluid, a high pressure liquid inlet and a high pressure liquid outlet for high pressure working fluid, and separate paths therein for said low pressure working fluid and said high pressure working fluid;

a cooling element adjacent said heat exchanger and in fluid communication with said low pressure liquid outlet;

a heating element adjacent said heat exchanger and in fluid communication with said high pressure liquid outlet;

a pair of double acting cylinders arranged in opposed cycling relation to each other, each cylinder having a piston and a port for the working fluid adjacent each end of the cylinder;

and valve means between said pair of cylinders and said heating and cooling elements for controlling the flow of low pressure working fluid and high pressure working fluid alternately to said cylinders, said valve means operatively connected to said cylinder ports and movable between positions for reversing the flow of low pressure and high pressure working fluids to said cylinders so that low pressure and high pressure working fluids are alternately supplied to said cylinders during each complete cycle of the engine in a continuous operation.

4,637,212
COMBINED HOT AIR TURBINE AND STEAM POWER PLANT

Emile Aguet, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

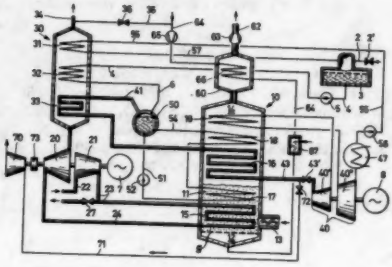
Filed Mar. 26, 1986, Ser. No. 844,480
Claims priority, application Switzerland, Apr. 29, 1985, 01805/85
Int. Cl.[4] F01K 23/10
U.S. Cl. 60—655 17 Claims

1. A combined hot air turbine and steam power plant comprising

a steam generator having means for creating a fluidized bed in a combustion zone thereof, a smoke flue for exhausting hot gases, at least one air heat exchanger disposed within the fluidized bed, an evaporator and a superheater;

at least one compressor connected to said air heat exchanger to deliver a flow of compressed air thereto;

a hot air turbine connected to said air heat exchanger to receive a flow of hot air therefrom and connected to said compressor to drive said compressor;



at least one waste heat boiler connected to said turbine to receive hot waste air therefrom and having at least one pre-superheater therein connected to said superheater in said steam generator to deliver a flow of steam thereto;

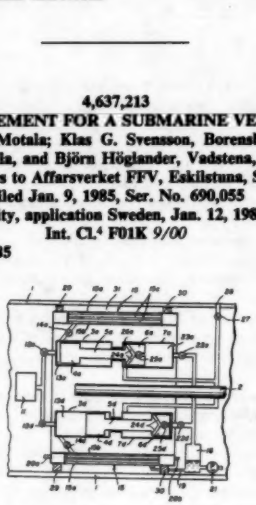
a water-steam separator connected to and between said evaporator and said pre-superheater to deliver a flow of steam from said evaporator to said pre-superheater; and

a steam turbine connected to said superheater to receive a flow of steam therefrom.

4,637,213
ARRANGEMENT FOR A SUBMARINE VEHICLE

Hans Lobell, Motala; Klas G. Svensson, Borensberg; Göran Gladh, Motala, and Björn Höglander, Vadstena, all of Sweden, assignors to Affarsverket FFV, Eskilstuna, Sweden

Filed Jan. 9, 1985, Ser. No. 690,055
Claims priority, application Sweden, Jan. 12, 1984, 8400134
Int. Cl.[4] F01K 9/00
U.S. Cl. 60—685 6 Claims



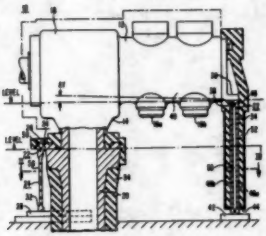
1. In a power plant for a submarine vehicle, a thermal engine, said engine having at least one operating cylinder and an exhaust gas outlet, an operating piston reciprocatable within said operating cylinder, compressor means for compressing exhaust gases from said engine, said compressor means having at least one compressor cylinder and an exhaust gas outlet, a compressor piston reciprocatable within said compressor cylinder, said compressor piston connected to said operating piston, and means for drainage of compressed exhaust gases from said compressor into the water surrounding said vehicle, said operating piston and said compressor piston being interconnected by means of a flexible piston rod.

4,637,214

SINGLE-ENDED STEAM CHEST WITH IMPROVED SUPPORT ASSEMBLY

George W. Y. Chang, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,705
Int. Cl.[4] F01B 31/06
U.S. Cl. 60—687 8 Claims



1. In combination with a single-ended steam chest for a power plant, said steam chest including a hollow elongated steam chest body, said steam chest body having a steam inlet therethrough proximate the bottom portion of one end thereof, said steam chest body having steam outlets therethrough in predetermined position, inlet pipe means affixed to said steam chest body proximate said steam inlet, the improvement which comprises

support assembly means comprising inlet end flexible plate support means of predetermined dimensions, flange member means affixed to said inlet pipe means in predetermined position, a first base member means for supporting said inlet end flexible plate means, said inlet end flexible plate means affixed at one end to said flange member means and at the other end affixed to said base member means, outlet end flexible support plate means affixed at the top thereof to the outlet end of said steam chest body proximate the bottom portion thereof, a second base member means for supporting said outlet end flexible plate means, said outlet end flexible plate means affixed at one end to said second base member means and at the other end to said steam chest body, said outlet end flexible support plate means comprising a pair of first flexible parallel plate members separated from one another by a predetermined distance so as to form a heating chamber between said first parallel plate members, said outlet end flexible support plate means having a length a predetermined amount greater than said inlet end flexible plate means, first insulation means affixed to and enclosing said outlet end flexible plate means, second insulation means is affixed to and encloses the inlet pipe whereby axial rotation of said steam chest body is diminished by controlling the thermal expansion of said first inlet end flexible support plate means and said outlet end flexible support plate means.

4,637,215

REGENERATOR WITH SPRAY COOLER

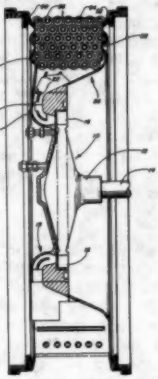
John Symington, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 23, 1985, Ser. No. 768,735
Int. Cl.[4] F01K 7/30
U.S. Cl. 60—688 7 Claims

1. A steam turbine system comprising:

a rotatable turbine wheel;

an annular heat exchanger radially outwardly of said wheel and having a first fluid path including an annular outlet and an inlet in fluid communication with said turbine wheel to receive exhaust steam therefrom and a second fluid flow path in heat exchange relation with said first path, said second path being adapted to receive feed water for the steam turbine; and



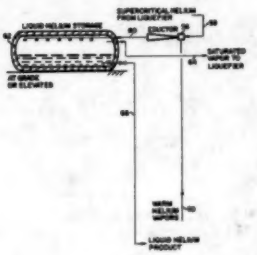
means for generating an annular, liquid spray across said first flow path at said outlet to remove heat from exhaust steam emerging from said outlet of said first fluid flow path.

4,637,216

METHOD OF RELIQUEFYING CRYOGENIC GAS BOILOFF FROM HEAT LOSS IN STORAGE OR TRANSFER SYSTEM

Thirthahalli A. Shenoy, Whitehall, and Arthur R. Winters, Jr., Coopersburg, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 27, 1986, Ser. No. 823,161
Int. Cl.[4] F17C 13/00
U.S. Cl. 62—54 10 Claims



1. In a process for the liquefaction of a cryogen, said cryogen being selected from a group consisting of hydrogen, helium, and neon, wherein unsaturated vapors are recycled to a liquefier, the improvement comprising:

(a) contacting the unsaturated vapors of said cryogen with the same cryogen in the liquid phase, to produce a saturated, essentially constant enthalpy vapor stream; and

(b) recycling said saturated, essentially constant enthalpy vapor stream back to the liquefier.

4,637,217

RAPID CONSTRUCTION OF ICE STRUCTURES WITH CHEMICALLY TREATED SEA WATER

Lawrence B. Owen, Salt Lake City, Utah; Daniel M. Masterson, Calgary, Canada, and Sidney J. Green, Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah and Geotechnical Resources Ltd., Calgary, Canada

Filed Jul. 22, 1985, Ser. No. 757,157
Int. Cl.[4] E02D *17/00*
U.S. Cl. 62—74 **13 Claims**

1. An improved method for the construction of load-bearing ice structures including ice platforms and grounded ice islands and the like wherein the ambient air temperature is in the range of about one degree C. to minus thirty degrees C. and wherein the structure is constructed from sea water, comprising the steps of:

adding to the sea water to be used in the construction of the load bearing ice structure an effective amount of a material selected from the group consisting of ice nucleation agents and fluorinated surfactants, fluorochemical surfactants, and amphoteric surfactants, and mixtures thereof, for the purpose of at least reducing the effect of supercooling in the case said ice nucleating agent and for reducing the surface tension of sea water in the case of said surfactants whereby solid ice is formed more quickly than in the absence of said material, and

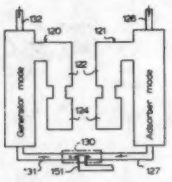
exposing said thus treated sea water to ambient air temperatures in the range of about minus 1 degree C. to minus 30 degrees C. thereby causing freezing to occur more completely by contact with the colder ambient than may be accomplished with untreated sea water exposed to the same ambient air temperatures and thus to form a load bearing ice structure.

4,637,218

HEAT PUMP ENERGIZED BY LOW-GRADE HEAT SOURCE

Dimiter I. Tchernev, 9 Woodman Rd., Chestnut Hill, Mass. 02167

Continuation of Ser. No. 605,812, May 1, 1984, abandoned, which is a continuation-in-part of Ser. No. 11,689, Feb. 12, 1979, Pat. No. 4,584,842, which is a continuation-in-part of Ser. No. 710,609, Aug. 2, 1976, Pat. No. 4,138,850, which is a division of Ser. No. 520,808, Nov. 4, 1974, Pat. No. 4,034,569. This application Nov. 18, 1985, Ser. No. 801,491
Int. Cl.[4] F25B *17/00*
U.S. Cl. 62—106 **43 Claims**



17. A process for heating and cooling an interior space by using a low-grade heat source, the process comprising the steps of:

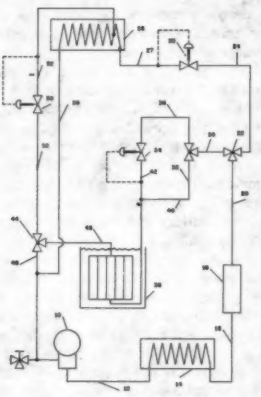
1. providing first and second pressure tight enclosures, each enclosure having a working refrigerant, an adsorbent material, a condenser and an evaporator therein, said adsorbent material being in thermal communication with a conduit which is provided for its respective enclosure, said adsorbent material being capable of adsorbing said refrigerant exothermically;
2. providing a low-grade heat source and means for it to be alternatively in thermal communication with said conduit for each said enclosure;
3. raising the vapor pressure of said refrigerant in said first enclosure and desorbing the refrigerant from said adsorbent material using said low-grade heat source;
4. allowing refrigerant vapor in said first enclosure to be received by said condenser therein, condensing said refrigerant vapor, and transferring said refrigerant's heat of condensation to said internal space or to the atmosphere;
5. lowering the vapor pressure of said refrigerant in said second enclosure by adsorbing said refrigerant by said adsorbent, and transferring the heat of adsorption thereby generated to said first enclosure via said conduits; and
6. repeating steps 3, 4 and 5 in the opposite of said enclosures.

4,637,219

PEAK SHAVING SYSTEM FOR AIR CONDITIONING

Ronald D. Grose, Omaha, Nebr., assignor to Enron Corp., Houston, Tex.

Filed Apr. 23, 1986, Ser. No. 854,910
Int. Cl.[4] F25B *5/00*; F24D *11/00*
U.S. Cl. 62—199 **2 Claims**



1. In an air conditioning system which comprises a compressor to compress a refrigerant, a condenser to remove heat from the refrigerant and condense it, and an evaporator to evaporate the refrigerant for recycle to the compressor, the improvement which comprises a peak shaving system comprising:

(a) means for storing a medium from which heat can be extracted and in which heat can be stored,

(b) a first control valve for optionally diverting the flow of the refrigerant from the condenser to the first expansion valve and into the evaporator or directing the refrigerant instead to the storage means,

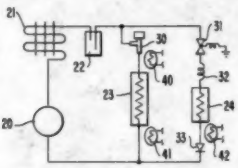
(c) a second control valve for optionally directing the flow of the refrigerant from the first control valve through a second expansion valve before the refrigerant reaches the storage means or bypassing the second expansion valve, and

(d) a third constant valve for optionally directing the flow of the refrigerant from the storage means to the compressor or through a third expansion valve to the evaporator.

4,637,220
REFRIGERATION SYSTEM FOR BOTH VEHICLE AIR CONDITIONER AND REFRIGERATOR

Riichi Sakano, Saitama, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 16, 1985, Ser. No. 809,233
Claims priority, application Japan, Dec. 14, 1984, 59-264234
Int. Cl.[4] F25B 5/00
U.S. Cl. 62—200 7 Claims



1. In a refrigeration system cooling both a vehicle passenger compartment and a refrigerator compartment located in the vehicle, the refrigeration system having a condenser to condense a pressurized refrigerant, a first evaporator receiving a first portion of the condensed refrigerant to heat the first portion by absorbing heat from the vehicle compartment, a second evaporator receiving a second portion of the condensed refrigerant to heat the second portion by absorbing heat from the refrigerator compartment, and a compressor receiving the heated refrigerant from the first and second evaporators to produce the pressurized refrigerant, the improvement comprising:

an expansion valve connected between the condenser and the first evaporator to vary the first portion of the condensed refrigerant in accordance with a variable control signal and to expand and cool the first portion;

a shutoff valve connected between the condenser and the second evaporator to control the admission of the second portion of the condensed refrigerant to the second evaporator, said shutoff valve having a closed state in which no refrigerant is admitted to the second evaporator and an open state in which the second portion is admitted to the second evaporator;

an expansion device connected in series between said shutoff valve and the second evaporator to expand and cool the second portion; and

control means responsive to the state of said shutoff valve, to a temperature of the first portion, and to a temperature of the second portion, to generate the control signal in accordance with the following criteria:

a. when said shutoff valve is closed, the control signal is generated in accordance with the temperature of the first portion; and

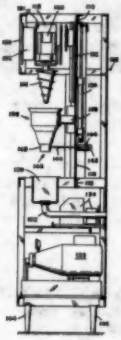
b. when said shutoff valve is open, the control signal is generated in accordance with the temperature of the second portion.

4,637,221
MIXING APPARATUS AND METHOD

Morris M. Levine, Scarsdale, N.Y., assignor to Sweet Victory, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 587,019, Mar. 7, 1984, Pat. No. 4,548,054. This application May 20, 1985, Ser. No. 735,682
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] A23G 9/00
U.S. Cl. 62—342 7 Claims

1. An apparatus for blending hard ice cream with at least one condiment comprising a refrigeration system, a funnel for holding the ice cream and condiment therein, cooling coil means in thermal communication with said funnel, said coil being coupled to said refrigeration system for freezing the ice cream therein, an auger in alignment with said funnel, an auger motor for rotating said auger in clockwise and counterclockwise directions, thus imparting reciprocating rotational motion to said auger, and means for relatively advancing said auger and said funnel toward each other while said auger is rotated

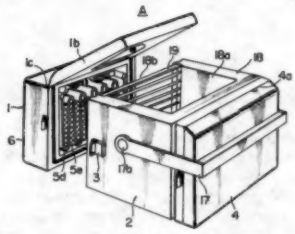


clockwise and counterclockwise until said funnel is telescoped over said auger, said advancing means imparting translatory motion only to said auger simultaneously with said reciprocating rotational motion of said auger.

4,637,222
REFRIGERATOR FOR VEHICLE

Kenichi Fujiwara, Kariya; Hideo Asano, Gifu; Eiichi Hasada, Okazaki; Kazuhisa Makida, Kariya, and Akinori Iida, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 25, 1985, Ser. No. 727,264
Claims priority, application Japan, Jun. 8, 1984, 59-118879; Dec. 27, 1984, 59-276721
Int. Cl.[4] F25D 3/08
U.S. Cl. 62—244 22 Claims



1. A refrigerator for a vehicle equipped with an air-conditioner having a refrigeration cycle including a compressor driven by an engine of the vehicle, a condenser connected to a discharge side of said compressor and operative to cool and condense refrigerant from said compressor, an air-conditioner pressure reducing means connected to a discharge side of said condenser and operative to reduce the pressure of the thus condensed refrigerant and expand the same, and an air-conditioner evaporator disposed between a discharge side of said pressure reducing means and a suction side of said compressor and operative to evaporate the thus expanded refrigerant, said refrigerator comprising:

a cooling unit including a casing of a heat-insulating structure, a refrigerator expansion means disposed in said casing and connected to said refrigeration cycle in parallel relationship to said air-conditioner pressure reducing

means, a refrigerator evaporator disposed in said casing and having an inlet connected to a discharge side of said refrigerator expansion means and an outlet communicated with a suction side of said compressor, a coldness-accumulating medium to be cooled by said refrigerator evaporator, and means in said casing for supporting said coldness-accumulating medium in heat exchange relationship with said refrigerator evaporator;

said cooling unit being adapted to be secured to the vehicle body;

a portable cool-keeping container of a heat-insulating structure adapted to be detachably connected to said cooling unit and removably accommodate goods to be cooled; and

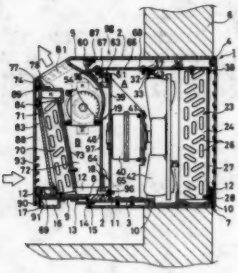
means for transferring the coldness from said cooling unit casing into said cool-keeping container when the latter is connected to said cooling unit and the refrigerator is in operation.

4,637,223

PACKAGED TERMINAL AIR-CONDITIONER

Yoshinori Hosoya; Shyozi Tunekawa; Wazoh Yamada, and Akira Shiraishi, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed Jul. 17, 1985, Ser. No. 756,020
Claims priority, application Japan, Jul. 19, 1984, 59-149959
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 **3 Claims**



1. A packaged terminal air conditioner, comprising:

a housing;

a bottom plate provided in a bottom of the housing;

a fan casing unit mounted on the bottom plate and including a partition which divides the interior of the housing into an indoor section, which is adapted to allow indoor air to flow therethrough, and an outdoor section, which is adapted to allow outdoor air to flow therethrough;

a cross-flow fan mounted in the fan casing unit for circulating indoor air drawn into the indoor section;

a supporting portion formed at a lateral end of the fan casing unit, the supporting portion supporting the cross-flow fan in the vicinity of the front of the partition;

an indoor heat exchanger arranged in front of the cross-flow fan, the indoor heat exchanger having a rear plate mounted at the rear side of the indoor heat exchanger;

a front cover mounted to the housing for covering the indoor heat exchanger and the cross-flow fan;

an outdoor heat exchanger arranged at the rear of the partition in the outdoor section; and

a rear cover mounted to the housing for covering the outdoor heat exchanger;

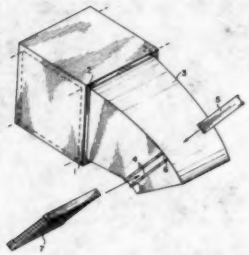
the partition defining a scrolling portion for the cross-flow fan, the partition and the rear plate of the indoor heat exchanger defining an air guide to direct the indoor air drawn into the indoor section toward the cross-flow fan.

4,637,224

HUMIDITY REDUCTION DUCT

Brian G. McGuigan, P.O. Box 965, Eagar, Ariz. 85925

Filed Nov. 13, 1984, Ser. No. 670,046
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—271 **15 Claims**



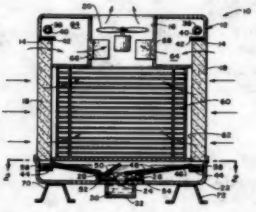
1. A humidity reduction duct assembly for registered installation with the air intake of an evaporative cooler, said assembly comprising: an elongated tapered duct having an upper surface, a lower surface and a first and second side surface enclosing said upper and said lowr surface and defining therewith an inlet at one end thereof and an outlet at the other end thereof, said outlet being positionable in registered sealed alignment with the air intake of the evaporative cooler when said duct assembly is installed thereupon, and slotted tray receiving means operatively interposed between inlet and said outlet in said first side surface of said duct and extending transversely across the interior of said duct to terminate at said second side thereof; a tray assembly having a rigid upper frame member, a rigid lower frame member disposed in generally parallel relationship to said upper member, and a plurality of foraminous cylinders mounted between said upper frame member and said lower frame member in generally parallel spaced relationship to each other, each of said cylinders being filled with an air permeable desiccant, said tray assembly being slidably inserted into said tray receiving means and extending across said duct so that air flow from said duct inlet to said duct outlet passes therethrough; and cover means attachable to said first side of said duct over said tray receiving means to secure said tray assembly therewithin and enclose said first side of said duct.

4,637,225

AIR CONDITIONING APPARATUS

Ralph C. Marshall, 539 East Ave. J-4, Lancaster, Calif. 93535, and Ronald P. Consoli, 16853 Magnolia Blvd., Encino, Calif. 91436

Filed Nov. 12, 1985, Ser. No. 797,010
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—285 **3 Claims**



1. An air conditioning apparatus comprising:

a housing forming an internal chamber, said internal cham-

ber having an air inlet opening and an air outlet opening, said housing having a cylindrical sump;

air movement means mounted on said housing within said internal chamber, said air movement means connected with said outlet opening, said air movement means functioning to move air through said inlet opening into said internal chamber and through said outlet opening into the ambient;

air passage means mounted on said housing covering said inlet opening, air is to be moved through said air passage means into said internal chamber;

water contained within said sump, said water to be conducted from said sump and dispersed across said air passage means;

a refrigerant fluid closed system located within said internal chamber, said refrigerant fluid closed system including a first set of coils located within said internal chamber, said first set of coils being located so that the air from said air passage means is conducted across said first set of coils prior to being discharged through said outlet, said refrigerant fluid closed system including a second set of coils, said second set of coils being located within said sump; and

water collection means mounted within said internal chamber, said water collection means to receive the water from said air passage means and conduct such into said sump, said water collection means including a plurality of separate channels to divide said water into a plurality of separate paths to be then permanently discharged into said sump, each said channel to tangentially discharge water into said sump, each said channel having a protruding flange, said protruding flange to extend within the confines of said sump and overhang a portion of said sump to cause said water to cascade into said sump thereby increasing turbulence.

4,637,226

DEVICE FOR THE CRYOGENIC TRANSFER OF SPECIMENS

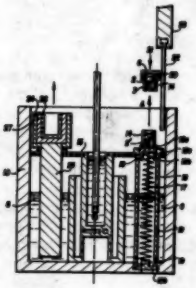
Hellmuth Sitte, Seefeld, Austria, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Aug. 15, 1985, Ser. No. 765,639

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430471

Int. Cl.⁴ F25B *19/00*

U.S. Cl. 62—514 R **20 Claims**



1. A device for use in transferring a specimen from an apparatus containing a cyrogenic coolant comprising a specimen holder and coolant transfer means for introducing coolant from said apparatus into said specimen holder whereby a specimen in said specimen holder is immersed in said coolant, said coolant transfer means including support means for supporting the specimen holder and guide means for guiding displacement of the support means, the guide means comprising a tube having a plurality of openings provided therein to permit said coolant to enter the tube.

4,637,227

FLAT KNITTING MACHINE HAVING COMPOUND NEEDLES

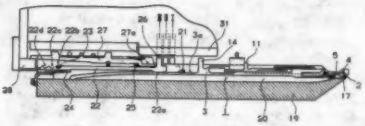
Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Co., Ltd., Wakayama, Japan

Filed Jun. 3, 1986, Ser. No. 879,891

Claims priority, application Japan, Jul. 19, 1985, 60-160803

Int. Cl.⁴ D04B *7/00*

U.S. Cl. 66—75.1 **16 Claims**



1. A flat knitting machine having compound needles of the type having a slider combined slidably with a needle body wherein the slider is back and forth movable over a given limited stroke relative to the needle body so that a latch portion of the slider is brought to a closed position and an open position with respect to a hook portion of the needle body, characterized in:

(1) that the needle body is so flexibly constructed as to allow a butt of the needle body to sink into a corresponding needle trick when the upper surface of the needle body is pressed at a point behind the butt;

(2) that both the slider and the needle body have one butt each provided thereon, the butt of the slider being located before the butt of the needle body;

(3) that a selector jack for pressing at the underside of its front portion the upper surface of the needle body at a point behind the butt thereof is disposed in the needle trick, above the needle body and behind the butt thereof, the front portion of the selector jack being pivotally movable and having an upwardly projecting butt provided thereon;

(4) that said selector jack is back and forth movable in the needle trick and adapted to be click stopped adjacent its rear end by means of a click stopper at three positions, advanced position (I), intermediate position (II), and retreated position (III), in the needle trick in the londitudinal direction thereof, being pivotally movable about the click stopper;

(5) that needle selector means for selectively moving any selector jack or jacks to any one of said three positions are arranged in individual needle tricks, at a level above the selector jacks therein, and on a carriage;

(6) that a knitting lock on the carriage includes a tuck position raising cam having a pair of raising cam faces for acting on the butt of each relevant needle body to raise the needle body to a tuck position, a pair of slider guide cams each having a lowering cam face for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position or into a stitch receiving course, to lower the slider into a tucking course, a pair of slider raising cams each having a raising cam face for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position or into the stitch receiving course, at a position ahead of said slider guide cam in the direction of movement of the carriage to raise the butt to a position that allows it to pass above said slider guide cam, a center guide cam for acting on the butt of the needle body to lower the needle body, and a pair of stitch cams;

(7) that a space which allows the entry thereinto of the butt of each needle body, when on a welt course, is formed between the respective back sides of said pair of raising

cam faces of the tuck position raising cam, there being disposed in the middle of said space a stitch-receiving-course raising cam having a pair of raising cam faces each for acting on the butt of the needle body at welt position to raise it into the stitch receiving course, with a pair of stitch receiving courses formed above said stitch-receiving-course raising cam, said stitch receiving courses extending from the spaces on both sides of the stitch-receiving course raising cam into the tuck receiving course;

(8) that the raising cam faces of said pair of slider raising cams consist of a pair of slider raising cams located on both sides of a widthwise median portion of the knitting lock, said raising cam faces each fronting toward one or the other direction of movement of the carriage and at a position slightly backward of said widthwise median portion of the knitting lock in the direction of carriage movement;

(9) that on a cam plate there is provided a stitch transfer position raising cam having a pair of raising cam faces for acting on the butt of each needle body raised to tuck position to raise the needle body to stitch transfer position;

(10) that said stitch transfer position raising cam has a half height in projection above the cam plate or is retractable;

(11) that on the cam plate and in relevant courses of action relative to the butts of individual selector jacks at advanced position (I), intermediate position (II), and retreated position (III) respectively, there are provided, at a phase covering the starting end of each raising cam face of said tuck position raising cam in the direction of carriage movement, side presser cams for selectively forcing the butts of needle bodies into the corresponding needle tricks and to their inoperative position relative to said tuck position raising cam; and at phases covering the respective raising cam faces of said stitch transfer position raising, slider raising, and stitch-receiving-course raising cams in the direction of the carriage movement, center presser cams for selectively forcing the butts of needle bodeies into the corresponding needle tricks and to their inoperative positions relative to these raising cams;

(12) that one of said center presser cams may select a half-pressing position at which the butt of each needle body is half depressed into the corresponding needle trick; and

(13) that the butt of said slider is displaceable between its inoperative position and its operative position relative to each of the slider raising cams according to the difference in the amount of depression by said one center presser cam between a full pressing position and a half pressing position or between a half pressing position and a retracted position.

4,637,228

FLAT KNITTING MACHINE HAVING COMPOUND NEEDLES

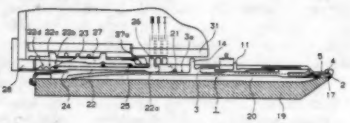
Masahiro Shima, Wakayama, Japan, assignor to Shima Idea Center Co., Ltd., Wakayama, Japan

Filed Jun. 27, 1986, Ser. No. 879,328

Claims priority, application Japan, Jul. 18, 1985, 60-159662

Int. Cl.[4] D04B 7/00

U.S. Cl. 66—75.1 **16 Claims**



1. A flat knitting machine having compound needles of the type having a slider combined slidably with a needle body wherein the slider is back and forth movable over a given limited stroke relative to the needle body so that a latch portion of the slider is brought to a closed position and an open position with respect to a hook portion of the needle body, characterized in:

(1) that the needle body is so flexibly constructed as to allow a butt of the needle body to sink into a corresponding needle trick when the upper surface of the needle body is pressed at a point behind the butt;

(2) that both the slider and the needle body have one butt each provided thereon, the butt of the slider being located before the butt of the needle body;

(3) that a selector jack for pressing at the underside of its front portion the upper surface of the needle body at a point behind the butt thereof is disposed in the needle trick, above the needle body and behind the butt thereof, the front portion of the selector jack being pivotally movable and having an upwardly projecting butt provided thereon;

(4) that said selector jack is back and forth movable in the needle trick and adapted to be click stopped adjacent its rear end by means of a click stopper at three positions, advanced position (I), intermediate position (II), and retreated position (III), in the needle trick in the londitudinal direction thereof, being pivotally movable about the click stopper;

(5) that needle selector means for selectively moving any selector jack or jacks to any one of said three positions are arranged in individual needle tricks, at a level above the selector jacks therein, and on a carriage;

(6) that a knitting lock on the carriage includes a tuck position raising cam having a pair of raising cam faces for acting on the butt of each relevant needle body to raise the needle body to a tuck position, a pair of slider guide cams each having a lowering cam face for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position or into a stitch receiving course, to lower the slider into a tucking course, a slider raising cam having a pair of raising cam faces for acting on the butt of slider of each compound needle whose needle body has been raised to the tuck position, at a position ahead of said slider guide cam in the direction of movement of the carriage to raise the butt to a position that allows it to pass above said slider guide cam, a center guide cam for acting on the butt of the needle body to lower the needle body, and a pair of stitch cams;

(7) that a space which allows the entry thereinto of the butt of each needle body, when on a welt course, is formed between the respective back sides of said pair of raising cam faces of the tuck position raising cam, there being disposed in the middle of said space a stitch-receiving-course raising cam having a pair of raising cam faces each for acting on the butt of the needle body at welt position to raise it into the stitch receiving course, with a pair of stitch receiving courses formed above said stitch-receiving-course raising cam, said stitch receiving courses extending from the spaces on both sides of the stitch-receiving course raising cam into the tuck receiving course;

(8) that on a cam plate there is provided a stitch transfer position raising cam having a pair of raising cam faces for acting on the butt of each needle body raised to tuck position to raise the needle body to stitch transfer position;

(9) that said stitch transfer position raising cam has a half height in projection above the cam plate or is retractable;

(10) that on the cam plate and in relevant courses of action relative to the butts of individual selector jacks at advanced position (I), intermediate position (II), and retreated position (III) respectively, there are provided, at a phase covering the starting end of each raising cam face of said tuck position raising cam in the direction of carriage movement, side presser cams for selectively forcing the butts of needle bodies into the corresponding needle tricks and to their inoperative position relative to said tuck position raising cam; and at phases covering the respective raising cam faces of said stitch transfer position raising, slider raising, and stitch-receiving-course raising cams in the direction of the carriage movement, center presser

cams for selectively forcing the butts of needle bodeies into the corresponding needle tricks and to their inoperative positions relative to these raising cams;

(11) that one of said center presser cams may select a half-pressing position at which the butt of each needle body is half depressed into the corresponding needle trick; and

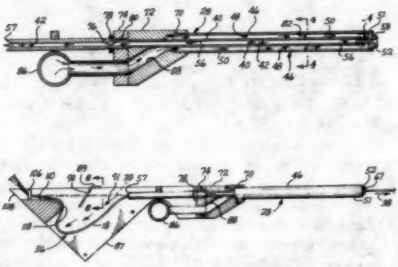
(2) that the butt of said slider is displaceable between its inoperative position and its operative position relative to the slider raising cam according to the difference in the amount of depression by said one center presser cam between a full pressing position and a half pressing position or between a half pressing position and a retracted position.

4,637,229

PNEUMATIC THREAD TENSIONING DEVICE

James W. Taylor, Jr., 5211 - 154th Ave. NE., Redmond, Wash. 98052

Filed Feb. 11, 1985, Ser. No. 700,452
Int. Cl.[4] D04B *15/44*; D03D *47/34*
U.S. Cl. 66—146 **29 Claims**



1. A pneumatic tensioning apparatus for maintaining a desired tension in a thread of yarn and the like, the apparatus comprising:

a first tubular member having an inner passageway extending the length thereof along an axis, and through which said thread may travel in a particular thread feed direction;

a second tubular member surrounding said first member so that the inner walls of said second member and the outer walls of said first member define an outer passageway that is coaxial with said axis;

an air supply means for supplying an airflow into said outer passageway in a direction that is substantially the same as said feed direction;

an orifice including a substantially annular throat region for communicating said airflow from said outer passageway into said inner passageway, said orifice connecting said passageways together in a manner so that the direction of said airflow is reversed and said airflow flows through said inner passageway in a direction opposite to said feed direction, such opposing flow causing a certain amount of tension in said thread; and including

means for adjusting the airflow rate through said orifice throat region by varying the size of said throat region.

4,637,230

CLOTHES WASHING MACHINE

Gerald L. Roberts, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1985, Ser. No. 742,047
Int. Cl.[4] D06F *31/00*
U.S. Cl. 68—4 **3 Claims**

1. A vertical axis clothes washing machine having wash, rinse, and centrifugal extraction operations comprising:

liquid and clothes containing means including a relatively large substantially imperforate outer receptacle, and a relatively large perforated clothes receptacle positioned within said receptacle;

an agitator extending upwardly into said clothes receptacle;

means for rotating said clothes receptacle and said agitator at a relatively high speed during said centrifugal extraction operation;

means for effecting a washing motion of said agitator;

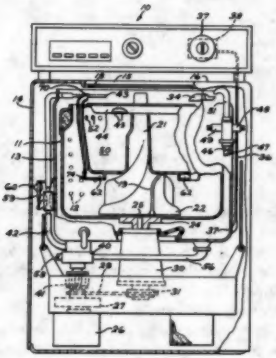
water inlet means for providing fresh water to said liquid and clothes containing means;

a control system including manually settable means for terminating the flow of water from said inlet means and for starting said means for effecting said washing motion of said agitator and said extraction operation;

a relatively small substantially imperforate basket positioned on said agitator and movable therewith;

a perforated filter pan mounted on said agitator covering substantially the entire top of said imperforate basket;

means being manually settable to provide a relatively high level of water when clothes are to be washed in said clothes receptacle and settable to a relatively low water level when clothes are to be washed in said basket;



a liquid recirculation means including a conduit connected between an inlet in said outer receptacle and an outlet means positioned for supplying water to said basket, pumping means arranged to pump liquid from said outer receptacle through said outlet means;

recirculating water control means including valve means in said conduit operable for terminating the flow of water to said outlet means after a predetermined amount of time so that clothes contained in said basket are washed in the selected volume of water independent of the volume of water in said receptacles; and

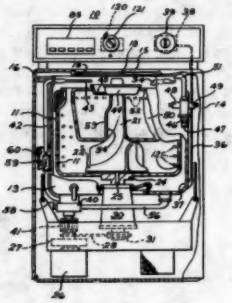
a secondary recirculation means including a conduit connected between an inlet in the lower portion of said imperforate basket and an outlet means positioned for supplying water through said filter pan to said basket whereby said washing motion of said agitator causes water to be pumped through said conduit independent of said liquid recirculation means.

4,637,231

CLOTHES WASHING MACHINE INCLUDING A HIGH DETERGENT CONCENTRATION WASH CYCLE

Stephen L. McMillan, Louisville; Alvin Akers, Jeffersontown, both of Ky., and Daniel N. Toma, Georgetown, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1985, Ser. No. 742,032
Int. Cl.[4] D06F *31/00, 33/02*
U.S. Cl. 68—4 4 Claims



1. A vertical axis clothes washing machine having wash, rinse, and centrifugal extraction operations comprising:

liquid and clothes containing means including a relatively large substantially imperforate outer receptacle, and a relatively large perforated clothes receptacle positioned within said receptacle;

an agitator extending upwardly into said clothes receptacle;

means for rotating said clothes receptacle and said agitator at a relatively high speed during said centrifugal extraction operation;

means for effecting a washing motion of said agitator;

water inlet means for providing fresh water to said liquid and clothes containing means;

a control system including manually settable means for terminating the flow of water from said inlet means and for starting said means for effecting said washing motion of said agitator and said extraction operation;

a relatively small substantially imperforate basket positioned on said agitator and movable therewith;

means being manually settable to provide a relatively high level of water when clothes are to be washed in said clothes receptacle and settable to a relatively low water level when clothes are to be washed in said basket;

a liquid recirculation means including a conduit connected between an inlet in said outer receptacle and an outlet means positioned for supplying water to said basket, pumping means arranged to pump liquid from said outer receptacle through said outlet means; and

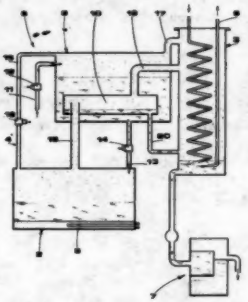
recirculating water control means including valve means in said conduit operable for terminating the flow of water to said outlet means after a predetermined amount of time whereby clothes contained in said basket are washed in a selected volume of water independent of the volume of water in said receptacle.

4,637,232

APPARATUS FOR THE RECYCLING OF SOLVENT USED IN DRY-CLEANING MACHINES AND SIMILAR EQUIPMENT

Guido Zacchini, Castelmaggiore, Italy, assignor to AMA Universal S.p.A., Castelmaggiore, Italy

Filed Apr. 8, 1985, Ser. No. 720,752
Int. Cl.[4] D06F *43/08*
U.S. Cl. 68—18 R 4 Claims



1. An apparatus for recycling solvent used in dry-cleaning machines comprising:

a distillation chamber having heater elements;

a pre-distillation unit comprising a tank having a first pipeline for receiving mingled water and solvent from a cleaning cycle and a second pipeline connecting the tank to the distillation chamber for discharging the mingled water and solvent into the distillation chamber, and a heat exchanger located within the tank, the heat exchanger being connected to the distillation chamber through a first pipe for receiving vapor from the distillation chamber; and

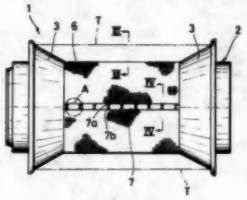
a water and solvent vapor condenser connected to the tank through a duct for exhausting into the condenser the vapor produced by predistillation of an azeotropic mixture of water and solvent.

4,637,233

BEAM FOR A DYEING APPARATUS

Takashi Tanaka, Kurobe, and Satoru Yamamoto, Toyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 628,894
Claims priority, application Japan, Jul. 9, 1983, 58-106756[U]
Int. Cl.[4] D06B *5/18*
U.S. Cl. 68—198 5 Claims



1. A beam for winding thereon materials to be treated with dyeing liquid, comprising:

(a) an inner tube having a multiplicity of first peripheral holes therethrough and adapted to be connected to a source of dyeing liquid;

(b) an outer tube having a multiplicity of second peripheral holes therethrough and mounted on said inner tube concentrically therewith in radially spaced relation, said sec-

ond holes being smaller in size and larger in number per unit area than said first holes;

(c) a woven screen fixedly encircling and engaging directly throughout the entire peripheral surface thereof said outer tube, and having a multiplicity of meshes smaller in size and larger in number per unit area than said second holes, said screen comprising a material that is resistant to heat and corrosion;

(d) a separate connector strip; and

(e) said screen being in the form of a sheet with non-overlapping opposite ends interconnected by said connector strip in an endwisely opposing relation with the latter.

4,637,234

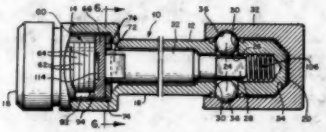
CARTRIDGE LOCK

Pekka A. Mielonen, Reijola, Finland, assignor to Oy Wartsila AB, Finland

Filed Aug. 13, 1984, Ser. No. 640,106

Int. Cl.[4] E05B *29/06, 67/36*

U.S. Cl. 70—34 **2 Claims**



1. A cartridge lock comprising an elongated housing and disposed therein a rotary disc assembly, a locking shaft and at least one bolting element;

said rotary disc assembly comprising a plurality of discs aligned concentrically within a cylinder, said cylinder being interconnected to one end of said locking shaft by means transmitting turning force therebetween;

said bolting element being partially disposed within a housing aperture adjacent said locking shaft;

said lock and locking shaft having a normal locked and an unlocked position, said locking shaft moving between said positions by axial rotation;

said locking shaft having at least one bearing surface which, when said locking shaft is at its locked position, is presented to said bolting element holding said bolting element partially protruding from out said housing, and when said locking shaft is rotated to its unlocked position, said bearing surface is translated to a position away from said bolting element, wherein upon key action turning said cylinder of said rotary disc assembly in a first direction, said locking shaft is rotated from its locked to its unlocked position and upon key action turning said cylinder in a second and opposite direction, said locking shaft is rotated back to its locked position;

a governor pin disposed protruding axially inwardly through said housing;

said cylinder further including a tailpiece about which is seated a C-shaped governor plate, the ends of said C-shaped governor plate forming a first and a second face that meet said governor pin at opposite sides of said governor pin when said locking shaft reaches one of its locked and unlocked positions; and

a first and a second mounting hole in said housing for said governor pin whereby when said governor pin is mounted in the first mounting hole, the first face of said governor plate meets said governor pin when said locking shaft is at its unlocked position and when said governor pin is mounted in the second mounting hole the first face of said governor plate meets said governor pin when said locking shaft is at its locked position.

4,637,235

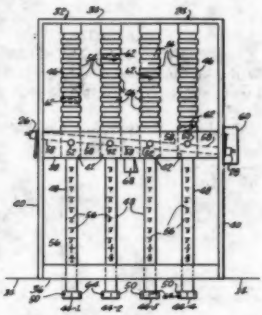
OPTO ELECTRIC COMBINATION LOCK

Edward Conner, 170 NE. 18th St., Pompano Beach, Fla. 33060

Filed Dec. 10, 1984, Ser. No. 680,095

Int. Cl.[4] E05B *47/00*

U.S. Cl. 70—277 **6 Claims**



1. A combination actuating device, comprising:

a plurality of moveable cylinders, each having an opening through the center thereof;

a frame for holding said cylinders and for allowing said cylinders to be moved according to a predefined combination to align said openings;

light providing means; and

light detecting means for causing an actuation signal to be provided when light from said light providing means is provided thereto;

said light providing means and light detecting means being positioned so that light is directed along a path from said light providing means towards said light detecting means through said cylinder openings when said cylinders have been moved by a predefined rotational angle and a predefined longitudinal distance in accordance with said predefined combination to be in alignment with said path.

4,637,236

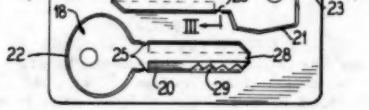
KEY AND RETAINER CARD COMBINATION

Donald F. Almblad, 5718 Capri La., Morton Grove, Ill. 60053

Filed Jun. 12, 1984, Ser. No. 619,936

Int. Cl.[4] A45C *11/32*; A47G *29/10*; A44B *15/00*

U.S. Cl. 70—458 **20 Claims**



1. A key and card combination, comprising:

a key carrying generally rectangular wallet size plastic card of credit card-type thickness and dimensions and having opposite faces;

at least one key recess in said card extending entirely through the thickness of the card;

a key of greater thickness than the card in said recess consisting of the same plastic material as said card, said key having a thickness for substantially resisting twisting when used in a lock;

said key having an edge thereabout, and said recess being

defined by an edge substantially surrounding said key edge;

and means on an area of said key edge and on a corresponding area of said recess edge for separably retaining the key in said recess and with the key having a face portion which is elevated from the plane of the adjacent card face.

4,637,237

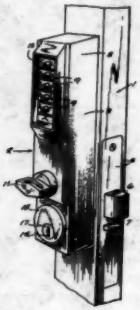
DOOR LOCKING SYSTEM

Edward J. Witkoski, Burlington, and Edgar G. Lizotte, Winsted, both of Conn., assignors to Simplex Security Systems, Inc., Collinsville, Conn.

Filed Sep. 27, 1985, Ser. No. 780,942

Int. Cl.[4] E05B *37/00*

U.S. Cl. 70—285 **20 Claims**



1. A door locking means comprising:

a door;

a combination lock on said door;

a latch bolt on said door, means normally biasing said latch bolt to an extended latched position,

a latch release for retracting the latch bolt against the biasing force to a retracted position; a mechanism including a member mounted on said door means normally biasing said member to a retracted position connected with said latch release, said mechanism including interposer means selectively and alternatively interrupting and transmitting control through the combination lock or key lock control;

a combination lock control;

a manual latch control operator connected to said combination lock control for selectively and alternatively operating said mechanism and said door latch release for unlatching said latch bolt; and

a key operated lock control for selectively and alternatively operating said mechanism and said latch release to unlatch said latch bolt.

4,637,238

FOLDING KEY FOR VEHICLES

Youichi Uda, Miyazaki; Seiya Matsushima, Sakado; Kazuhiko Saito, Kodaira; Shoji Yamamoto, Tokyo, and Kazuhiro Murakami, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Honda Lock Manufacturing Co., Ltd., Miyazaki, both of, Japan

Filed Dec. 23, 1985, Ser. No. 812,292

Claims priority, application Japan, Dec. 28, 1984, 59-196861[U]; Feb. 20, 1985, 60-23780[U]

Int. Cl.[4] A44B *15/00*

U.S. Cl. 70—456 R **12 Claims**

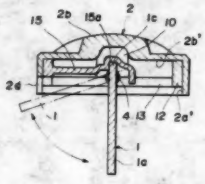
1. A folding key for a vehicle having a key cylinder, comprising:

a dished cap having an outer end surface, an outer peripheral surface axially extending from a periphery of said outer end surface and forming a peripheral edge, a cut-out formed in a portion of said peripheral edge of said outer peripheral surface, and an inner end surface having a recess formed therein;

a bearing portion provided in said cap; and

a key body having one end thereof supported by said bearing portion and being pivotable with respect to said cap about said bearing portion, said key body being engageable with said cut-out when said key body pivots ultimately;

said cap being arranged on the vehicle so as to allow said key



body to be levelled substantially in parallel to an advance direction of the vehicle;

said cap being arranged on the vehicle in a manner such that part of said key cylinder is fitted in said recess of said inner end surface of said cap; and

said portion of the peripheral edge of said cap, in which said cut-out is formed, being located rearwardly of the peripheral edge with reference to the advance direction of the vehicle.

4,637,239

VEHICULAR LOCK SYSTEM WITH ANTILOCKOUT PROTECTION

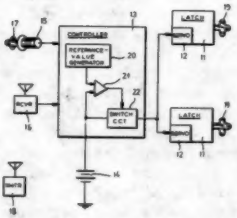
Frank Kleefeldt, Heiligenhaus, and Peter Bartel, Hattingen, both of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Jan. 16, 1985, Ser. No. 692,023

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402788

Int. Cl.[4] E05B *65/36*

U.S. Cl. 70—264 **4 Claims**



1. A vehicular lock system used in combination with a battery and comprising:

at least one latch settable in an unlocked position, a locked position permitting manually opening only by a key, and an antitheft position preventing manual opening even with the key;

an electric servomotor powerable by the battery for displacement of the latch between at least the antitheft and locked positions, the servomotor being unable to move the latch between the positions when the battery power is below a predetermined minimum;

externally operable control means connected between the battery and the servomotor for feeding the battery power

to the servomotor for displacing the latch at least between the antitheft and locked positions;

means for generating a reference signal corresponding to the minimum battery power; and

comparator means connected to the battery and to the generating means for comparing the battery power and the reference signal and connected to the control means for displacing the latch from the antitheft position to the locked position when the battery power falls below the predetermined minimum represented by the reference signal.

4,637,240

CYLINDER LOCK

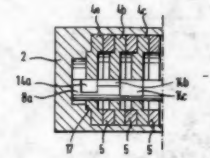
Kyösti Nevalainen, and Kaarlo Martikainen, both of Joensuu, Finland, assignors to Oy Wärtsilä Ab, Helsinki, Finland

Filed Jun. 25, 1985, Ser. No. 749,084

Claims priority, application Finland, Jul. 10, 1984, 842749

Int. Cl.[4] E05B 29/04

U.S. Cl. 70—366 **11 Claims**



1. A cylinder lock including a number of locking discs each having two substantially parallel opposite end faces and provided with a key opening, the locking discs being arranged in a stack having a predetermined axial length so that a keyway for receiving a key is formed jointly by the key openings, whereby the locking discs are turnable by means of combination surfaces of the key to a predetermined angular position, and at least one of the locking discs having a key-engaging surface that is substantially shorter in the axial direction of the stack than the distance between the two opposite end faces of the disc and is located asymmetrically with respect to a plane of the locking disc that lies midway between and parallel to the two opposite end faces of the disc, so that the location of the key-engaging surface of said one disc relative to other discs of the stack can be changed without affecting the length of the stack by reversing the orientation of said one locking disc in the stack of discs.

4,637,241

FULLY UNIVERSAL ROLLING PROCESS FOR H OR I-BEAM TYPE METAL SECTIONS

Jacques M. Michaux, Joeuf, France, assignor to Sacilor, Hayange, France

Filed Mar. 21, 1984, Ser. No. 591,865

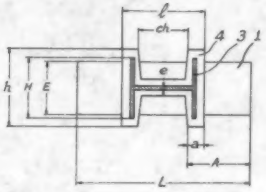
Claims priority, application France, Mar. 21, 1983, 83 04589

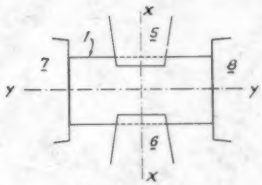
Int. Cl.[4] B21B 1/10, 1/14

U.S. Cl. 72—225 **17 Claims**

1. A process for forming a rough beam type metal section having a web forming portion and flange forming portions comprising the use of a universal stand and a two-high stand, said universal stand having two horizontal rolls and two vertical rolls, by passing an initial section of rectangular or trapezoidal cross section through a roll gap formed by said rolls of said universal stand, said process comprising the steps of:

(a) recessing the web forming portion in a first series of universal passes through said roll gap by means of the horizontal rolls exerting direct pressure on the central portion of the initial section while the vertical rolls exert only sufficient pressure on the initial section to resist spread of the metal in the horizontal direction caused by recessing of the web and to maintain the initial section in the direction of the centerline of rolling upon discharge from the universal stand for achieving, during this step, greater reduction of the web forming portion than the flange forming portion; and





(b) thereafter simultaneously reducing the web and flange forming portions in succeeding passes through said roll gap by means of the horizontal rolls and vertical rolls of the universal stand exerting direct pressure on the web forming portion and flange forming portions, respectively.

4,637,242

LOCATOR DEVICE FOR A TOOL PROVIDED WITH CRIMPING DIES FOR CABLE SHOES

Hans Undin, Åkersberga, and Hans Wiener, Täby, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,246

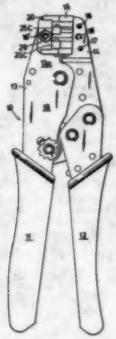
Claims priority, application Sweden, Apr. 19, 1983, 8302185

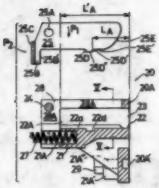
Int. Cl.[4] B21D 7/06

U.S. Cl. 72—410 **8 Claims**

1. A locator device for a tool with crimping dies for cable shoes which have a crimping portion and a contact portion of different lengths, wherein the device comprises a body which has first and second ends and comprises at least one elongated track for accommodating said contact portion of a cable shoe inserted into the tool, means for attaching said body to the tool, said track extending from said first end toward the second end of the body and having a bottom portion, two side walls and a stationary first stop means at said second end, said stop means terminating said track at a distance from said first end which corresponds to the longest crimping portion of a cable shoe to be treated in the tool, a stop carrier with an operating means and which is constantly affected by a spring force and is against this force movable transversely to the direction of the track; at least one movable second stop means arranged on said stop carrier between said first and second ends at a distance from said first end which corresponds to the length of a shorter contact portion of a cable shoe to be treated, and which at least one second stop means either clears or bars said track, depending on the position of the stop carrier, wherein the stop carrier is defined by an elongated planar plate extending parallel with

the track and pivoted to the body at said second end thereof, and said second stop means is defined by a forward edge of a





projection on said plate extending towards the bottom portion of the track.

4,637,243

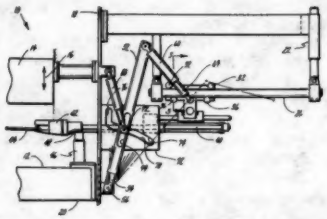
PRESS LINKAGE WITH CONTROLLED DWELL

Irvin D. Bond, 10270 Allen Rd., Clarkston, Mich. 48016

Filed Sep. 3, 1985, Ser. No. 772,037

Int. Cl.[4] B21J *13/10*

U.S. Cl. 72—421 **8 Claims**



1. The combination comprising:

a frame;

a first press member mounted on the frame;

a second press member mounted on the frame so as to be moveable with respect to the first press member along a first path of motion, between open and closed positions, the first press member and the second press member having an opening between them;

workpiece support means moveable toward positions depending on the position of the first press member and the second press member;

linkage means pivotally mounted on the frame and connected to the workpiece support means such that as the linkage means is pivoted in a first direction, the workpiece support means is moved along a path of motion with respect to the opening defined between the first press member and the second press member, the linkage means having a slot;

an elongated connecting member having a first end connected to the movable, second press member so as to be moveable therewith, and its opposite, second end connected to the slot in the linkage means so as to be moveable therewith;

a cam plate mounted on the frame, the cam plate having a slot; and

follower means connected to the second end of the connecting member and received in the cam slot so as to follow the same whereby as the linkage means is pivoted in said first direction, the workpiece support means moves with respect to the moveable press member with a controlled rate of motion according to the slot in the cam plate.

4,637,244

METER PROVERS

Robert Maurer, 31A The Avenue, Cowley, Uxbridge, Middlesex, and Peter C. Epstein, 8A Fitzroy Park, Highgate, London N6 6HP, both of England

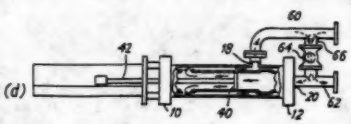
PCT No. PCT/GB83/00306, § 371 Date Jul. 23, 1984, § 102(e) Date Jul. 23, 1984, PCT Pub. No. WO84/02185, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 28, 1983, Ser. No. 634,098

Claims priority, application United Kingdom, Nov. 26, 1982, 8233714; May 3, 1983, 8312078

Int. Cl.[4] G01F *25/00*

U.S. Cl. 73—3 **9 Claims**



1. In a meter prover for proving a meter connected in a fluid flow path where the meter prover is of the type having

(a) means providing a proving bore;

(b) a piston disposed in the proving bore and movable along said bore in sealed engagement with the wall of the bore, said piston starting its proving run from an initial upstream position;

(c) means for connecting the proving bore in parallel with a section of the flow path not containing the meter; and

(d) by pass valve means operable to cause fluid flow selectively through the proving bore or through said parallel flow path section;

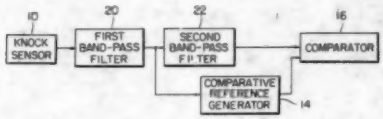
whereby in a proving run, the piston moves axially in synchronism with fluid flow along the proving bore and displaces a known volume within the bore, the improvement wherein

the effective area of the upstream face of the piston acted on by fluid pressure is less than the effective area of the piston's downstream face acted on by fluid pressure so that on reestablishment of flow through said parallel flow path section after a proving run, substantially equal fluid pressures act on said faces of the piston, whereby the difference in effective area of those faces causes the piston to be restored to its initial upstream position.

4,637,245
KNOCK DERIVING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Toshio Iwata, and Atsushi Ueda, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 27, 1985, Ser. No. 749,590
Claims priority, application Japan, Jun. 29, 1984, 59-135718
Int. Cl.⁴ G01L *23/22*
U.S. Cl. 73—35 **3 Claims**



1. A knock deriving apparatus for an internal combustion engine comprising:

a knock sensor responsive to vibrations of the engine producing an output signal containing a broad range of frequencies including a frequency component representing knocks in said engine;

a first frequency filter means having a bandwidth for passing a predetermined frequency component of the output signal of said knock sensor and producing a first filtered signal containing a range of frequencies which is wider than the frequency component representing knocks and includes frequencies representing engine noise including noise resonance frequencies near the knock frequency component;

a second frequency filter means having a narrower bandwidth than and connected to said first frequency filter means for passing the frequency component representing knocks received from said first frequency filter means while blocking frequencies representing engine noise, and producing an output;

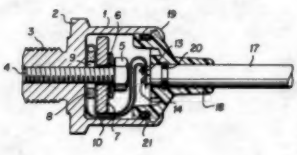
a comparative reference generator connected directly to receive the first filtered signal of said first frequency filter means for generating a comparative reference signal representing the average of the first filtered signal produced by said first frequency filter means; and

a comparator for comparing the outputs of said comparative reference generator and said second frequency filter means to derive said knocks.

4,637,246
AXIAL ACCELERATION SENSOR

Claude Lombard, Chesnay, Claude Moyses, Paris, Gerad Catier, Issyles Moulineaux, and Bernard Montaron, Toulouse all of France, assignors to Regie Nationale des Usines Renault, Boulogne Billancourt and Renix Electronique, Toulouse, both of, France

Filed Nov. 30, 1984, Ser. No. 676,808
Claims priority, application France, Dec. 2, 1983, 83 19294; May 29, 1984, 84 08380
Int. Cl.⁴ G01L *23/22*
U.S. Cl. 73—35 **7 Claims**



1. A sensor for detection of axial accelerations in an internal combustion engine, comprising:

a case having a base including means for fastening said case to a source of said axial accelerations;

a piezoelectric element in said case and having an aperture;

a seismic mass in said case and having an aperture;

a headed cylindrical element fixed to said base, said cylindrical element passing through said apertures of said piezoelectric element and said seismic mass with said piezoelectric element being positioned on said cylindrical element between said base and said seismic mass;

spring means mounted on said cylindrical element and pressing on said seismic mass for biasing said piezoelectric element between said base and said seismic mass;

electrical output means mounted on said case; and

flexible electrical connection means comprising:

(a) an elongate strip of flexible insulating material having a flat face,

(b) two annular conductive layers on said flat face,

(c) apertures through said insulating material at centers of said annular conductive layers, said insulating material being folded at a position between said conductive layers and said insulating material being mounted on said cylindrical member with said cylindrical member passing through said apertures thereof and said annular conductive layers each engaging an opposite side of said piezoelectric element,

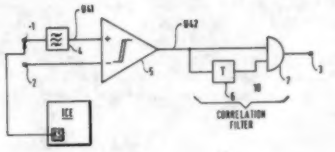
(d) two conductive terminal layers on said flat face at positions spaced from said annular conductive layers and each terminal layer connected to said electrical output means, and

(e) conductive connecting layers on said flat face and each said connecting layer connecting one of said annular conductive layers with one of said terminal layers.

4,637,247
METHOD OF RECOGNIZING KNOCKING SIGNALS IN A RECEIVED SIGNAL DERIVED FROM A KNOCKING SENSOR IN AN INTERNAL COMBUSTION ENGINE, AND SYSTEM CARRYING OUT THE METHOD

Adolf Dreyer, Oberriexingen, and Herman Roozenbeek, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,612
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430000
Int. Cl.⁴ G01L *23/22*
U.S. Cl. 73—35 **11 Claims**



3. In combination with an internal combustion engine (ICE) subject to knocking, having a knock sensor (KS) providing sensor output signals,

a system for recognizing knocking signals in the sensor output signal, derived from the sensor, which derived signal includes a mixture of background noise signals, disturbance signals, and knocking signals, if said knocking signals are present,

said system comprising, in accordance with the invention,

a correlation filter coupled to receive the derived signal, said correlation filter (40) including

means (63) for generating a cyclically recurring correlation signal having an average frequency which is a function of the knocking signal expected from the engine (ICE) upon knocking or incipient knocking operation thereof, and

means (73) coupled to receive the correlation signal and said derived signal for correlating said signals;

a filter (4) connected to receive signals from the sensor (KS) and filtering said signals with respect to a predetermined bandpass range including the frequencies of the knocking signals expected from the engine (ICE); and

a comparator means (5) having a reference input terminal (2);

wherein (FIG. 4)

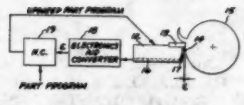
the correlation filter (40) is connected between the output of the bandpass filter (4) and another input of the comparator means (5), the frequency of the cyclically recurring signals being tuned to match one of the frequencies passed by the bandpass filter, said correlation filter providing an output upon correlation between the derived signal and the correlation signal and thereby indicating presence of a knocking signal.

4,637,248

ADAPTIVE DISPLACEMENT SENSOR FOR CONTOUR MACHINING

Robert A. Thompson, Quaker Street, and Robert S. White, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 3, 1985, Ser. No. 783,894
Int. Cl.[4] G01B *13/12*
U.S. Cl. 73—37.5 **14 Claims**



1. An adaptive displacement sensing system for in-process tool condition monitoring and inspection of contoured workpieces on a machine tool comprising:

a tool having a cutting tip beneath which is supported a rotating nozzle that has a rectangular displacement sensing orifice;

means to rotate said nozzle so that the plane of said rectangular orifice is kept parallel to machined contoured workpiece surfaces during a machining operation; and

means to supply fluid to said rotating nozzle and for sensing fluid back pressure and generating an output signal representing distance from said nozzle to said workpiece surface.

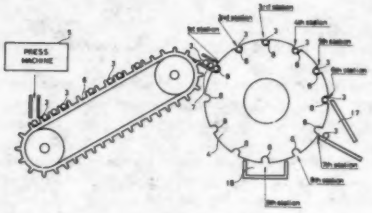
4,637,249

BATTERY CAN HOLE DETECTING APPARATUS

Morio Ishizaki, Itami, and Akiyoshi Nishikawa, Osaka, both of Japan, assignors to Ishizaki Press Kogyo Co., Ltd., Itami, Japan

Filed Sep. 10, 1985, Ser. No. 774,545
Claims priority, application Japan, Mar. 20, 1985, 60-57014
Int. Cl.[4] G01M *3/02*
U.S. Cl. 73—41 **3 Claims**

1. An apparatus for detecting and separating defective, leaking battery cans from perfect battery cans made by press drawing, comprising can supply means for providing a substantially continuous flow of cans, rotor means having can receiving and positioning means in its circumferential surface spaced at suitable intervals in said surface, said rotor means being arranged for receiving cans in said can receiving and positioning means from said can supply means, clamping means arranged for cooperation with said can receiving and positioning means for holding a can in a fixed position in said can receiving and positioning means, said clamping means comprising piston cylinder means (9, 9a) including a piston rod for pressing against a closed can end, and an insert portion for insertion into an open can end to hold a can between said piston rod and said insert portion, said insert portion closing an inner space in a can, air introducing means having an air inlet port passing through said insert portion for introducing air under pressure into said inner space in a can, pressure responsive switch means arranged for actuation by a certain air pressure value in said inner space in a can, first can discharge means (17) arranged for discharging perfect cans from said rotor means, second can discharge means (18) arranged downstream of said first can



discharge means (17) as viewed in the direction of rotation of said rotor means for discharging defective cans from said rotor means, first control means operable by said pressure responsive switch means for controlling said clamping means to release a perfect can to said first discharge means when said pressure responsive switch means have been actuated for removing said piston rod from said closed can end, whereby air pressure inside said inner space releases a perfect can from said insert portion to said first discharge means (17), and second control means arranged for cooperation with said clamping means when a defective can reaches said second discharge means (18) for removing said piston rod from said closed end of a defective can, and for substantially simultaneously blowing air through said insert portion to release a defective can from said insert portion to said second discharge means.

4,637,250

APPARATUS AND METHOD FOR VISCOSITY MEASUREMENTS FOR NEWTONIAN AND NON-NEWTONIAN FLUIDS

Thomas F. Irvine, Jr., and Noh-Aeok Park, both of Stony Brook, N.Y., assignors to State University of New York, Stony Brook, N.Y.

Filed Jan. 25, 1985, Ser. No. 694,747
Int. Cl.[4] G01N *11/12*
U.S. Cl. 73—57 **19 Claims**

1. An apparatus for the determining viscosity of fluids comprising:

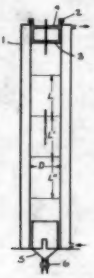
a. A cylinder, of diameter D cm., for holding the fluid for which the viscosity is to be determined;

b. Means for measuring axial displacement a predetermined distance, L cm., along the vertical axis of the cylinder, remote from the top and bottom by a distance of at least D cm.;

c. A needle, made of tubing with rigid side walls the density of which can be adjusted with thin metal wiring to produce a velocity of fall of almost 0 to about 10 cm. per sec. and sealed hemispherically at both ends, having a diameter d cm., wherein b=D/d is at least 5, and a length of l cm., wherein l/D is at least 2.5;

d. Means engaging the top of the cylinder for guiding said needle so that the needle will fall along the axis of said cylinder;

e. Means for maintaining a constant temperature in the cylinder; and



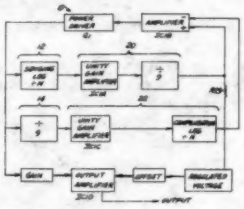
f. Device for measuring the time of fall of the needle between the predetermined distance marked on the cylinder.

4,637,251

SYMMETRICAL BRIDGE CIRCUIT FOR MEASURING MASS AIR FLOW

Ralph W. Carp, Newport News, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 18, 1986, Ser. No. 830,317
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.2 **11 Claims**



1. A symmetrical bridge circuit for measuring mass air flow comprising:

power driver means electrically connected to a source of power for supplying electrical power;

sensing leg means including a first sensing leg and a second sensing leg, said sensing leg means having a sensing element located in the air flow and responsive to the rate of the air flowing across said sensing element, each of said first and second sensing legs having an input, an output and a control lead intermediate said input and output;

compensation leg means including a first compensation leg and a second compensation leg, said compensation leg means having a compensation element located in the air flow and responsive to the temperature of the air flow, each of said first and second compensation legs having an input, an output and a control lead intermediate said input and output;

a control amplifier electrically coupled to the control leads from each of said second sensing leg and said compensation leg and operable to control the output of said power driver means for supplying power to the input of said sensing leg means and said compensation leg means; and

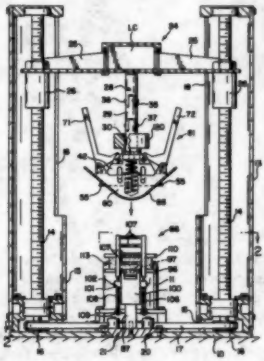
an output amplifier means responsive to the output of said power driver means for generating a signal representing the mass of the air flowing across said sensing and compensation elements.

4,637,252

TEST INSTRUMENT

Chong-Kon Rhee, Broadview Heights, Ohio; David M. McKibben, Cleveland, Ohio, and Jeffrey N. Bibbee, Lake Jackson, Tex., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Continuation of Ser. No. 421,749, Sep. 23, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,654
Int. Cl.[4] G01N *19/04*
U.S. Cl. 73—150 A **22 Claims**



1. The process of measuring tack of elastomeric compositions, comprising the steps of bringing two specimens of elastomeric stock into abutting contact to define a contact area under an initial contact pressure, maintaining said contact pressure between said two specimens for a predetermined first time interval which is a dwell time, separating said contact between said specimens within a second time interval at a predetermined separation rate, measuring the tack as energy per unit contact area required to separate said stock specimens by integrating the force to separate said specimens over said second time interval for complete separation to occur, and multiplying said integral by said separation rate and dividing the product by contact area to give tack.

4,637,253

SEMICONDUCTOR FLOW DETECTOR FOR DETECTING THE FLOW RATE AND FLOWING DIRECTION OF FLUID

Masayuki Sekimura, Yokohama, and Shunji Shirouzu, Ayase, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 14, 1985, Ser. No. 733,796
Claims priority, application Japan, May 22, 1984, 59-103028; May 22, 1984, 59-103030
Int. Cl.[4] G01F *1/68*; G01P *5/10*
U.S. Cl. 73—189 **13 Claims**

1. A semiconductor flow detector for detecting a flow rate and flowing direction of fluid, comprising:

a first semiconductor flow detecting element including a first heating element formed in the center portion of a semiconductor substrate and a first pair of temperature-measuring elements arranged on side edge portions of the semiconductor substrate to have the first heating element sandwiched therebetween, said temperature measuring elements being positioned symmetrical with respect to the first heating element;

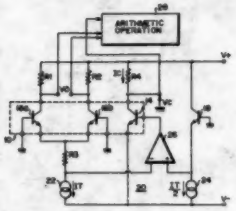
means for detecting the temperature of the fluid under measurement to generate a temperature detection signal;

a first driving means for heating the first heating element in accordance with the temperature detection signal to keep the temperature of the first semiconductor flow detecting

element higher by a prescribed level than the temperature of the fluid under measurement;

a first electric power detecting means for detecting the electric power corresponding to the current flowing through the first heating element and contributing to the heating thereof so as to generate a first electric power detection signal Vc;

a second driving means for driving the first pair of the temperature measuring elements;



a first temperature difference detecting means for detecting the difference in temperature between the first pair of the temperature measuring elements in terms of an electric signal so as to generate a first temperature difference signal Vo; and

an arithmetic means for performing a prescribed arithmetic operation based on following equations so as to obtain the flow rate Vf and flowing direction θ of the fluid, said equations being $Vc=a\cdot Vf$ and $Vo=b\cdot(Vf)^{\frac{1}{2}}\cos\theta$ wherein a and b are essentially constant.

4,637,254

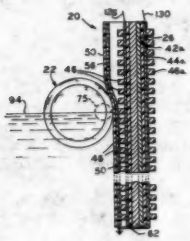
GAUGE APPARATUS FOR MEASURING LIQUID LEVELS

Jerry F. Dyben, Fort Wayne, Ind., and Stanley S. Wulc, Rydal, Pa., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Oct. 10, 1984, Ser. No. 659,326

Int. Cl.[4] G01F *23/68, 23/76*

U.S. Cl. 73—314 **44 Claims**



1. Gauge apparatus for measuring liquid levels comprising a buoyant device adapted to float in the liquid being measured, said buoyant device including a body which has an annular portion and is formed of magnetic material, an immersible elongated sensor adapted to be arranged in upright position and having an electrical characteristic which may be varied, means connecting said buoyant device to said sensor for movement with respect thereto for varying said electrical characteristic in response to variations in elevation of said buoyant device caused by changes in level of the aforesaid liquid, said connecting means including force-generating means for holding said buoyant device in operative engagement with said sensor, said force-generating means including a permanently magnetized device that provides a concentrated magnetic field along a path that extends longitudinally of said sensor, said buoyant device and said magnetized device including means for maintaining said buoyant device in aligned registry with said path while said annular portion is in rolling engagement with said sensor, and means for measuring said electrical characteristic thereby to provide an indication of such level.

4,637,255

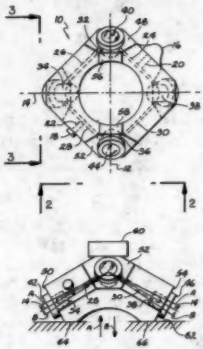
NON-PLANAR RING LASER ACCELEROMETER

Graham J. Martin, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 30, 1985, Ser. No. 814,878

Int. Cl.[4] G01P *15/08*

U.S. Cl. 73—517 R **9 Claims**



1. An accelerometer comprising, in combination:

(a) a block;

(b) a non-planar cavity within said block;

(c) said cavity comprising a plurality of substantially straight intersecting segments;

(d) means for generating at least one rotating beam of laser light within said cavity;

(e) a mirror arranged adjacent each of said cavity intersections to direct light between said intersecting segments;

(f) a proofmass contacting said block so that said block is elastically deformed in a predetermined manner in response to acceleration force; and

(g) means for determining said acceleration force as a function of the light within said cavity.

4,637,256

ULTRASONIC PROBE HAVING DUAL-MOTION TRANSDUCER

Yoshiyuki Sugiyama, Ayase; Shinichiro Aoki, Kawasaki, and Yasuyuki Morita, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1984, Ser. No. 623,752

Claims priority, application Japan, Jun. 23, 1983, 58-113707; Sep. 27, 1983, 58-178529; Dec. 5, 1983, 58-229310

Int. Cl.[4] G01N *29/04;* A61C *19/04;* A61B *10/00*

U.S. Cl. 73—633 **12 Claims**

1. An ultrasonic probe comprising:

an elongated housing having an acoustic window at one end thereof;

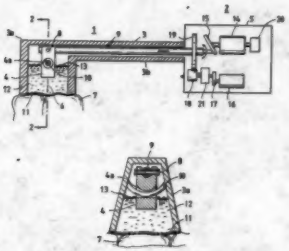
an ultrasonic transducer located in said housing for emitting an acoustic beam through said acoustic window;

a dual motion drive means located at the other end of said housing for providing dual motions having a reciprocating motion and a swing motion transverse to the reciprocating motion; and

means for coupling said drive means to said transducer to transmit thereto said dual motions so that said beam is steerable in orthogonal directions, wherein said coupling means comprises:

a drive shaft connected at one end to said dual motion drive means to transmit said reciprocating and swing motions to the other end thereof; and

means for movably mounting said transducer at the other end of said drive shaft so that said transducer is swingable in a first plane in response to said reciprocating motion and in a second plane normal to said first plane in response to said swing motion, wherein said transducer is formed with an opening extending in the transverse direction of the housing, said mounting means comprising:



a pivot member extending through said transducer and said drive shaft in said transverse direction; and

an arcuate guide member spaced from said pivot member, the guide member extending through said opening so that said transducer is swingable about said guide member in response to said reciprocating motion and further swingable about the axis of said drive shaft in response to said swing motion.

4,637,257

PRESSURE DIFFERENCE MEASURING DEVICE WITH A SEMICONDUCTOR PRESSURE SENSOR

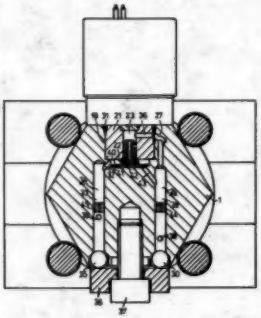
Moriz von Rauch, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,564

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3443419

Int. Cl.[4] G01L *7/08, 9/00*

U.S. Cl. 73—706 **2 Claims**



1. A pressure difference measuring device having a semiconductor pressure sensor in a pressure pickup body and having at each end face thereof a separating diaphragm with an adjacent supplemental diaphragm, wherein on both sides of the semiconductor pressure sensor a connecting canal is provided and from each connecting canal, at an end facing away from the semiconductor pressure sensor, a spur canal is provided which leads to a respective separating diaphragm and a further spur canal is provided which leads to a respective supplemental diaphragm adjacent to the other separating diaphragm, and further comprising a damping element arranged in at least one connecting canal, the semiconductor pressure sensor being associated with an equalizing diaphragm having a stiffness which is greater than that of the supplemental diaphragms but less than that of the semiconductor pressure sensor, both sides of the equalizing diaphragm being connected to respective ones of the connecting canals in the region between the semiconductor pressure sensor and the damping element.

4,637,258

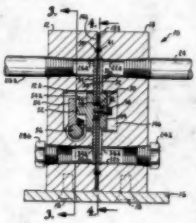
PRESSURE DIFFERENTIAL CONTROL MECHANISM

Wayne A. Priest, Kansas City, Kans., assignor to SOR, Inc., Olathe, Kans.

Continuation of Ser. No. 551,027, Nov. 14, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,681

Int. Cl.[4] G01L *7/08*

U.S. Cl. 73—716 **2 Claims**



1. An operating assembly for sensing changes in a pressure differential between the high and low sides of a fluid system and translating said changes into movement of a control operating member, said assembly including:

a housing containing a chamber having an outer annular portion defined by confronting parallel walls, an intermediate portion contiguous with said outer annular portion, of substantially greater depth than said annular portion and also defined by confronting parallel walls, and a central piston receiving portion of greater depth than said intermediate portion,

a piston assembly located within said chamber said piston assembly having a high pressure side and an opposed low pressure side, said piston assembly including

(a) A disk-like outer portion fitting into the intermediate portion of said chamber with opposite faces on the disk-like portion parallel to and confronting the respective walls of the intermediate portion of the chamber, the perimeter of said disk-like portion being slightly spaced inwardly from the inward perimeter of said annular portion of said chamber,

(b) A central piston body affixed to said disk-like portion and located in the said central portion of said chamber, and

(c) A flexible, fluid impermeable membrane extending between the perimeter of said disk-like portion and outer perimeter of said annular portion of said chamber and defining with said disk-like outer portion and piston body an uninterrupted barrier dividing said chamber into high and low pressure sides,

means for communicating the pressures on the low and high pressure sides of said fluid system with the low and high pressure sides of said piston assembly,

said membrane permitting movement of said piston assembly in response to a positive pressure differential to bring the low pressure side face of said disk-like portion into bearing contact with the confronting wall of the intermediate portion of said chamber thereby to cause substantially all of the load imposed by the high pressure on said piston assembly to be imposed on said confronting wall, and

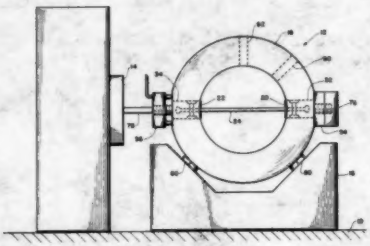
control means associated with and operable responsive to movement of said piston body caused by changes in pressure differential in said system.

4,637,259

FATIGUE TEST MACHINE

David I. G. Jones, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 6, 1985, Ser. No. 805,518
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—794 3 Claims



1. A fatigue testing apparatus for testing a specimen under combined low cycle and high cycle loading which comprises: a test fixture, means for supporting said test fixture and means for applying a dynamic load to said test fixture, wherein said test fixture consists essentially of:

(a) a right circular cylinder having:

an inside diameter, an outside diameter, a height and a central axis;

a first radial opening in said cylinder, said opening having a height dimension parallel to said central axis not greater than about 70% of said cylinder height and a circumferential dimension not greater than about 70% of said cylinder height, and

a second radial opening in said cylinder diametrically opposite said first opening, said second opening having substantially the same dimensions as said first opening;

(b) a pair of specimen clamping means having:

a first portion adapted to slidably fit into said radial openings in said cylinder,

said first portion comprising means for receiving and clamping a specimen, and a second portion comprising means to limit the travel of said clamping means into said radial openings toward said central axis,

wherein at least one of said clamping means further comprises means for applying a static pressure to a specimen clamped between said clamping means,

wherein one of said clamping means further comprises means for connection to said dynamic load-applying means; and

wherein said supporting means comprises means to support said cylinder at at least two nodal points for a desired mode of vibration at a resonant frequency defined by the formula

$$f_N = \frac{1}{2\pi}\sqrt{\frac{EH^2N^2(1-N^2)^2}{12\rho R^4(1-\nu^2)(1+N^2)}} \quad (1)$$

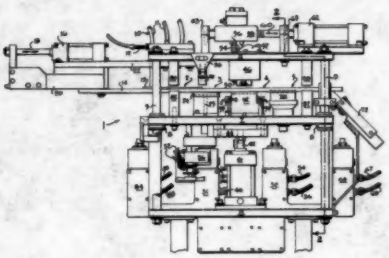
where N is an integer corresponding to the mode of vibration, E is Young's modulus, N is the mode number, ρ is the density of the material of said cylinder, ν is Poisson's ratio, H is the thickness of said cylinder and R is the average radius of said cylinder.

4,637,260

CAN END TESTER

Edward C. Gilliam, Midlothian; John M. Jackson, Glade Springs, and Billy J. Lamie, Bristol, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 808,552, Dec. 13, 1985, abandoned.
This application Aug. 14, 1986, Ser. No. 895,589
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—826 20 Claims



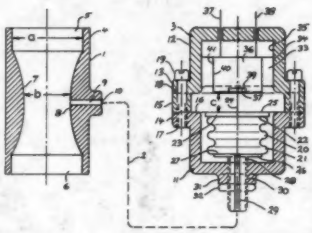
1. Apparatus for testing sequentially a plurality of non-detachable easy-open beverage can ends for proper opening thereof comprising an entry station for said ends, a station for optically orienting said ends into a proper position for opening, a station for opening said ends and subsequently optically testing said ends for proper opening thereof, means for opening and closing said stations and means for transporting said ends through said stations.

4,637,261

MASS-FLOW SENSING TRANSDUCER FOR INTERNAL COMBUSTION ENGINES

Robert A. Kraus, and Edmund J. Kraus, both of 1636-T E. Edinger Ave., both of Santa Ana, Calif. 92705

Filed Nov. 27, 1985, Ser. No. 802,435
Int. Cl.[4] G01F *15/02*; G01M *19/00*
U.S. Cl. 73—861.02 10 Claims



1. Apparatus for measuring the mass flow rate of air, by performing separate air density, and air flow rate sensing functions, and to provide a single electric output signal relevant thereto, comprising in combination:

a. flow obstruction means comprising housing means provided with an air inlet and an air outlet at axial ends thereof, a venturi constriction having a narrow throated portion, and fluid passageway from within said narrow throat to a suction port;

b. ultrasonic device for causing a shift in phase of propagated sonic waves between two elements within a confined space;

said ultrasonic device comprising first housing portion having concentrically disposed a first cavity, and second housing portion having concentrically disposed a second cavity, each

being defined by a cylindrical inner surface and an end wall, said housing portions having suitable means for longitudinal separation to a given distance from each other, so as to form radially extending, fluid communicative passageways from within said cavities to atmosphere; and means for fastening said first and second housing portions to each other; said first cavity houses concentrically within disposed a single ultrasonic generator means, having electric terminals, and centrally disposed, a single piezoelectric element, having leads connected to said terminals, and being disposed to face said second housing portion; said second cavity houses a wave reflecting means facing said piezoelectric element at a specified distance of no less than one quarter wave length apart; said wave reflecting means being fixed to a hermetically sealed, pressure responsive means so as to establish a coaxial relationship between said pressure responsive means, said wave reflecting means, and said ultrasonic generator means; said pressure responsive means having a fluid communicative passageway from within said pressure responsive means; said passageway being fluid communicative connected to said suction port, whereby occurring pressure changes at said suction port causes axial movement of said wave reflecting means, thereby causing a shift in phase of propagated ultrasonic waves between said wave reflecting means and said piezoelectric element; said ultrasonic device further comprises, sequentially connected, electronic oscillator means for generating a fixed oscillator frequency and amplitude, resistance means, and said ultrasonic generator means for generating ultrasonic waves equal to said oscillator frequency; wherein said piezoelectric element of said ultrasonic generator means possesses a natural resonant frequency equal to said oscillator frequency; and wherein in operation said resistance means serves to maintain a constant current flow through said piezoelectric element; said resistance being substantially greater than the impedance of said piezoelectric element, wherein variations in said impedance causes the voltage at said terminals to follow said impedance; and wherein the variations in impedance is a function of antiresonant frequency caused by a shift in phase between the vibrations of the piezoelectric element, and the returning waves impinging on said piezoelectric element; and wherein said shift in phase is a consequence of changes in air temperature and the distance between said piezoelectric element and said wave reflecting element; thereby causing an electric output signal at said terminals being proportional to said mass flow rate.

4,637,262

MASS FLOW RATE METER

Pekka Vesa, Kansakoulukatu 5, 15700 Lahti 70, Finland

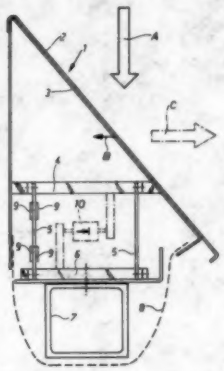
Filed Jun. 21, 1985, Ser. No. 747,413

Claims priority, application Finland, Jul. 16, 1984, 842852

Int. Cl.[4] G01F *1/30*

U.S. Cl. 73—861.73 **11 Claims**

1. A mass flow rate meter, comprising a collision plate (1) for a mass flow to be measured to collide with, means (4, 5) for supporting collision plate (1) so as to allow said collision plate to move along a substantially horizontal path which is substantially transverse to the mass flow direction (A(before impact)), as well as means for sensing the distance travelled by collision plate (1) or the force applied to said collision plate in its travelling direction, characterized in that collision plate supporting means (4, 5) comprise spring plates (5), which are perpendicular to the direction of movement (B) of said collision plate and spaced from each other in the same direction as the direction of movement (B), the upper ends of said spring plates being rigidly fastened to a clamping element (4) of collision plate (1) and the lower ends thereof being rigidly secured to a body (6, 7), the ratio of the stiffness of spring plates (5) relative to the weight of the structure carried by the spring plates being



selected in a manner that the specific resonance frequency of said collision plate is higher than 4 Hz.

4,637,263

MULTI-COMPONENT FORCE AND TORQUE MEASUREMENT CELL WITH STRAIN GAUGES

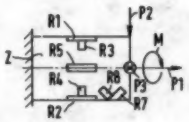
Harald Fritz, Waldbronn, and Peter Wurll, Karlsruhe, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,392

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431202

Int. Cl.[4] G01L *5/16*

U.S. Cl. 73—862.04 **2 Claims**

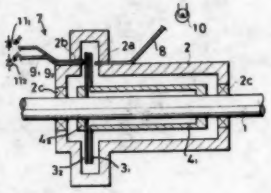


1. A multi-component force and torque measurement cell of the type having a plurality of strain gauges connected to form half-bridge circuits with a constant current source in each branch and being oriented on a measurement spring with a defined force introduction for longitudinal and transverse forces and torques relative to the strain directions of the measurement spring and deriving a clearly correlated response in reference to the forces and torques, said cell having an adequate number of strain gauges so that using the measured voltage tapped at the half-bridge circuits and the standardized elongation effects of the forces or torques impacting the corresponding strain gauges an adequate number of equations can be generated to determine all forces and torques, comprising 2n+2 (n=non-zero integer number) strain gauges subdivided into two series circuits each incorporating half the number of strain gauges and a constant current source which are further connected to each other at both ends and to the ground so that measured voltages can be tapped between sequentially corresponding connecting points of strain gauges immediately adjoining each other in both series circuits.

4,637,264
OPTICAL TORQUE DETECTOR

Tsuneo Takahashi, Kawagoe, and Hirofumi Otsuka, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1985, Ser. No. 736,054
Claims priority, application Japan, May 18, 1984, 59-98631; Nov. 19, 1984, 59-174252[U]
Int. Cl.⁴ G01L *3/12*; G01D *5/38*
U.S. Cl. 73—862.33 **3 Claims**

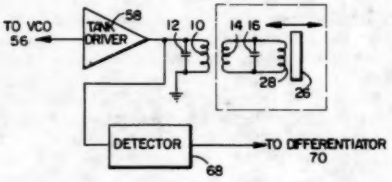


1. An optical torque detecting apparatus for a rotating shaft of which torsional torque is to be detected, comprising a pair of rotary plates disposed as to face one another connected to the shaft with a predetermined interval between the positions where each is connected to the shaft, each plate having a radial optical grid thereon, so that a Moire fringe pattern may be created in accordance with change of relative turning between the two rotary plates caused by torsion of the shaft, and detecting means for detecting a shift of the Moire fringe pattern between radially outer and inner sections of the optical grids so that the torsional torque of the shaft may be detected thereby; each line of the optical grid formed on one of the two rotary plates being a radially extended straight stepless line, and each line of the optical grid formed on the other of the two rotary plates being a stepped one comprising a radial directional inner half portion and a radial directional outer half portion which are different in phase one from another by ½ of the pitch of the optical grid, the detecting means comprising a pair of optical detecting means for detecting respective light rays transmitted through the radial directional outer portion and the radial directional inner portion of the two rotary plates so that the number of times of the shift of the Moire pattern between the foregoing two sections and the direction of the shift thereof may be reliably detected by output signals from the two optical detecting means.

4,637,265
SENSOR APPARATUS

David Fiori, Jr., Yardley, Pa., assignor to Sensor Technologies, Inc., Bensalem, Pa.

Filed Jul. 22, 1985, Ser. No. 757,726
Int. Cl.⁴ G01L *3/10*; G01B *7/16*
U.S. Cl. 73—862.33 **52 Claims**

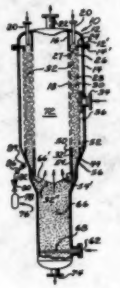


52. Sensor apparatus comprising:
a sensor unit including:
(a) first and second inductively coupled tank circuits which produce a double resonance curve for said first tank circuit, said first tank circuit mechanically isolated from a member to which movement is imparted and said second tank circuit affixed to said member, and
(b) sensing means affixed to said member, electrically connected to said second tank circuit and responsive to a parameter being monitored for changing, in accordance with changes in the said parameter, the relative resonance frequencies of said first tank circuit, the relative amplitudes of the resonance peaks of said first tank circuit, and the relative phases about the resonance peaks of said first tank circuit;
and circuit means responsive to at least one of said changing characteristics of said first tank circuit for developing indications of changes in said parameter.

4,637,266
PROCESS FOR SAMPLING PARTICULATE MATTER PASSING FROM ONE TREATMENT ZONE TO ANOTHER

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 686,053, Dec. 24, 1984, Pat. No. 4,567,022.
This application Dec. 11, 1985, Ser. No. 807,725
Int. Cl.⁴ G01N *1/02*
U.S. Cl. 73—863.86 **9 Claims**



1. A method for obtaining a sample of particles from a system in which said particles move downward in a moving bed and are contacted successively by a first gas and a second gas, said sample being representative of particles which have been contacted with said first gas but which have not been contacted with said second gas, where the particles move through an upper zone in order to contact the first gas and move through a lower zone in order to contact the second gas, where said upper zone is comprised of a cylindrical upper portion of a vertical vessel having disposed within a pair of cylindrical, coaxial, radially-spaced screen elements known as an inner screen element and an outer screen element, where said screen elements confine the particles to form an annular bed of particles, where an annular gas distribution space is formed between the outer screen element and the side wall of said vessel, where the first gas flows radially inward from said gas distribution space through said annular bed and then flows upward within said inner screen member to exit from the upper zone, where the lower zone is comprised of a cylindrical lower portion of said vessel which is wholly filled with particles and of a smaller diameter than the upper portion of said vessel, and where the second gas flows upward through the particles in the lower zone and enters the upper zone, said method comprising: (a) passing particles leaving the upper zone into a transition zone, where said transition zone is an extension of said annular bed which is bounded by (i) a tapered portion of said vessel located between the upper zone and the lower zone, wherein the diameter of said tapered portion of said vessel is at a maximum at the top; (ii) a vertical cylindrical outer transition

ring member of the same diameter as the outer screen element and attached thereto and coaxially disposed in the transition zone, where said outer transition ring member extends downward from the bottom of the outer screen element to said tapered side wall; and, (iii) a vertical cylindrical inner transition ring member of the same diameter as the inner screen element and attached thereto and coaxially disposed in the transition zone, where said inner transition ring member extends downward from the bottom of the inner screen element toward the tapered side wall and restricts the horizontal area for catalyst flow out of the annular bed into the lower zone; (b) passing a portion of said first gas from said annular gas distribution space into the top of the transition zone and downward out of the bottom of the transition zone into the lower zone; and, (c) removing said sample from the transition zone.

4,637,267

ENGAGEMENT CONTROL OF THE STARTER PINION FOR INTERNAL COMBUSTION ENGINE STARTER

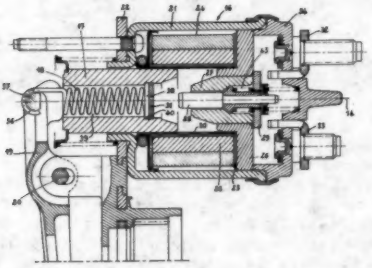
Alfred B. Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyons, France

Filed Jul. 10, 1985, Ser. No. 753,606

Claims priority, application France, Jul. 10, 1984, 84 11324

Int. Cl.[4] F02N *15/06;* **H01H** *50/20*

U.S. Cl. 74—7 A **5 Claims**



1. Engagement control of the starter pinion for a starter of an internal combustion engine, more particularly for the starter of a motor vehicle, including a pinion (**11**) of the starter (**10**) axially movable for engagement with a starting ring gear (**12**) of the internal combustion engine, a solenoid (**16**) having a mobile core (**17**) with a central bore (**3**), a helical spring connected between said core (**17**) and one end of a lever (**19**), the lever having another end connected to the drive **13** of the starter (**10**), said engagement control comprising:

at least one end turn (**38**) of said helical spring (**18**), located on the side of said mobile core (**17**) of said solenoid (**16**), opposite said lever (**19**) being brought close to the preceding turn located in a plane perpendicular to the axis (**14**) of said spring (**18**), and widened in diameter, to be supported and held against an annular shoulder (**40,41***a*) formed in said central bore (**39**) of said mobile core (**17**).

4,637,268

PLANER DRIVE

Gert Braun, and Ernst Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun Industrieanlagen, Fed. Rep. of Germany

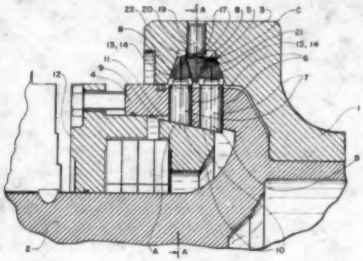
Filed Aug. 27, 1985, Ser. No. 769,867

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432551

Int. Cl.[4] F16H *15/00*

U.S. Cl. 74—190 **6 Claims**

1. A planar drive, comprising a sprocket wheel for a planing chain and a driveshaft for the sprocket wheel, said sprocket wheel having a secondary chain ring and said drive shaft a primary chain ring, said secondary chain ring having a revolving, conical, annular groove associated with said primary chain ring and having radial holes distributed over its circumference and associated with the annular groove of clutch pins in said radial holes having conical pinheads wedgeable in the annular groove, a freely mounted centering ring with a wedge surface working against the bases of said pin and axially and radially adjustable in said primary chain ring of a pressure ring over said primary chain ring having conical pin heads in the form of clutch pins with friction segments attached to said clutch pins, said primary chain ring having radial holes for said clutch pins



arranged on at least two circles juxtaposed at a predetermined distance, said friction segments being attached to said clutch pins and forming two revolving friction rings whose outer flanks work against the sides of said annular groove, said secondary chain ring having at least on one circle located in projection between the two circles on the primary side, a friction ring immersing centrally between the two friction rings on the primary side and working with an appropriate amount of taper against the inner flanks of the latter, and in that the friction ring on the secondary side is mounted so as to be axially movable in the annular groove.

4,637,269

DRIVE APPARATUS

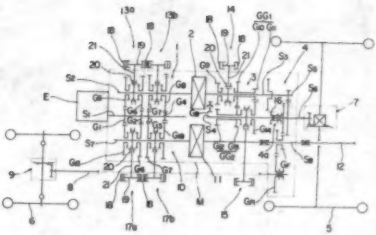
Shigekazu Hasegawa, and Tetsu Fukui, both of Sakai, Japan, assignors to Kubota, Ltd., Japan

Filed Jun. 6, 1983, Ser. No. 501,486

Claims priority, application Japan, Jul. 16, 1982, 57-108369[U]; Nov. 4, 1982, 57-194400; Nov. 5, 1982, 57-195133

Int. Cl.[4] F16H *3/02, 3/08, 3/38;* **B60K** *20/10*

U.S. Cl. 74—335 **6 Claims**



1. A drive apparatus comprising:

an input shaft operatively connected to an engine;

an output shaft operatively connected to travelling means;

a transmission line operatively interconnected between said input and output shafts, said line including first and second intermediate shafts;

clutch means disposed between said first and second intermediate shafts for operatively interconnecting and disconnecting said first and second intermediate shafts;

change speed means including at least one change speed shift means for effecting speed changes between said input shaft and said first intermediate shaft, said shift means including synchro shift means and a first hydraulic switch valve moveable between neutral, first and second change speed positions, said change speed means further including a shift selector for selective operation of said first switch valve;

said clutch means being responsive to the neutral position of the shift means for effecting the operative disconnection, and responsive to the change speed positions of the shift means for effecting the operative interconnection of the first and second intermediate shafts;

a source of pressurized fluid, said shift selector and clutch means being hydraulically connected in parallel to said source of pressurized fluid; and

a first pilot fluid operated switch valve hydraulically connected between said fluid source and clutch means;

said first hydraulic switch valve being (a) operative in the first and second change speed positions to supply pilot fluid to the first pilot fluid operated switch valve for causing said first pilot switch valve to switch to a selected position for providing communication of the clutch means with the source of pressurized fluid, and (b) operative in the neutral position to block the pilot fluid to the first pilot fluid operated switch valve for causing said first pilot switch valve to switch to another selected position for preventing communication of the clutch means with the source of pressurized fluid.

4,637,270

ARRANGEMENT FOR GOVERNING VEHICLE ENGINE SPEED RESPONSIVE TO ACTUAL RUNNING SPEED OF THE VEHICLE

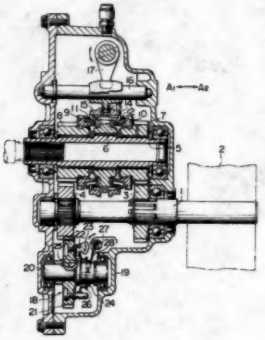
Noboru Yanagiuchi, Kobe; Shigeo Adachi, Akashi; Masatoshi Inoue, Himeji; Hiroshi Takata, Hyogo, and Toyoshi Matsuda, Kakogawa, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 12, 1985, Ser. No. 722,450

Claims priority, application Japan, Apr. 16, 1984, 59-56187[U]

Int. Cl.[4] F16H *5/46*

U.S. Cl. 74—336.5 **4 Claims**



1. In combination:

a vehicle engine having an output shaft,

a transmission capable of conducting a shift between a power transmitting stage and a neutral stage and having an input shaft,

an automatic stepless speed changer connecting said input shaft of said transmission to said output shaft of said engine,

a governor device comprising a rotational speed detecting means for producing an output corresponding to speed of said input shaft of the transmission, and

a control means for controlling an output of said engine in accordance with the output of said speed detecting means.

4,637,271

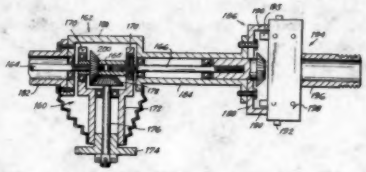
FLEXIBLE UNIVERSAL GEAR BOX SYSTEM WITH YOKES

Joseph Giocastro, 64-28 Metropolitan Ave., Middle Village, and Salvatore Giocastro, 53-11 73rd St., Maspeth, both of N.Y. 11379

Continuation-in-part of Ser. No. 448,846, Dec. 15, 1982, abandoned. This application Sep. 19, 1984, Ser. No. 652,002

Int. Cl.[4] F16H *35/00;* **B60K** *17/30*

U.S. Cl. 74—386 **1 Claim**



1. A flexible joint system associated with the front and rear portions of a motor vehicle, comprising, in combination:

a generally horizontal pivot member

a pair of opposed first and second yoke means rotatably connected to said pivot member said first yoke means being secured to the front portion of said vehicle and said second yoke means being secured to the rear portion of said vehicle, said final and second yoke means being movable relative to one another,

a generally horizontal shaft member rotatably connected to and transversely passing through said first yoke means and disposed approximately perpendicular to said pivot member,

first bevel gear means secured to said pivot member between said first and second yoke means,

second bevel gear means perpendicular and meshing with said first bevel gear means and secured to said shaft member,

said second yoke means being for rotating about said pivot member relative to said first yoke means and for rotating said second bevel gear means relative to said first bevel gear means in response to movement of said rear portion of said motor vehicle; and said first yoke means being for rotating about said pivot member relative to and for rotating said first bevel gear means relative to said second bevel gear means in response to movement of said front portion of said motor vehicle,

first bearing means for rotatably supporting said pivot member relative to said first and second yoke means,

second bearing means for rotatably supporting said shaft member relative to said first yoke means,

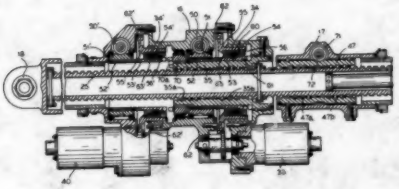
said second yoke means being connected to the rear portion of said vehicle, said pivot member being axially connected to the rear axle of the rear wheels of said vehicle, said shaft member being the driving member and said pivot member being the driven member, said first yoke means beng connected to the front portion of said vehicle; whereby said vehicle is articulated about the pivot member between the front and rear portions of the vehicle.

4,637,272

BALLSCREW ACTUATOR

Duane R. Teske, Rockford, Ill.; Henry E. Senasack, Jr., Annapolis, Md., and Mark Wilkins, Burke, Va., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 28, 1985, Ser. No. 791,692
Int. Cl.[4] F16H *1/00*
U.S. Cl. 74—424.8 R 19 Claims



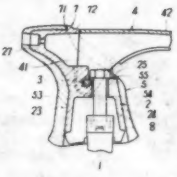
16. An actuator which is dual failure tolerant comprising, a ballscrew, a pair of ballnuts on said ballscrew, first and second housings each rotatably mounting one of the ballnuts, a pair of independently operable drive units on the first housing and each having a drive motor, means for drivingly connecting one or the other of said drive motors to a first of said pair of ballnuts associated with the first housing including a pair of clutches having disengaged positions and engaged positions for selectively connecting one of the drive motors to said first ballnut, and a third drive unit on the second housing including a drive motor, and means drivingly connecting the third drive unit motor to the second of said pair of ballnuts.

4,637,273

BICYCLE BRAKE OPERATING DEVICE POSITIONED ON A DROP HANDLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 26, 1985, Ser. No. 705,528
Claims priority, application Japan, Mar. 3, 1984, 59-30863[U]
Int. Cl.[4] G05G *11/00*
U.S. Cl. 74—489 6 Claims



1. A brake operating device for a bicycle, said brake operating device being secured to a drop handle of said bicycle, said brake operating device comprising:

a bracket secured to a bent rod section of said drop handle, said bracket having a pair of side walls and front and rear walls in continuation of said side walls respectively and having a rear portion with an opening which opens rearwardly of said bracket;

an operating lever having a pivot portion interposed between said side walls, said pivot portion extending through said opening and being pivoted to said bracket, said operating lever further having an operating portion extending from said pivot portion rearwardly with respect to said opening in said bracket;

a bracket cover formed of an elastic material and covering an outer surface of said bracket; and

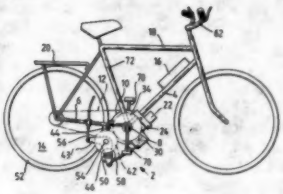
a restraint member coupled with one of said bracket and said operating lever, said restraint member being positioned at an opening side of said opening in said bracket and comprising an engaging portion engaging with an edge portion of said bracket cover covering said outer surface of said bracket, whereby when a cyclist steers said bicycle while gripping said brake operating device such that said cyclist's weight is transmitted to said bracket, said restraint member is in position to restrain said bracket cover from moving relative to said bracket in response to application of said cyclist's weight.

4,637,274

AUXILIARY DRIVE FOR PEDAL-DRIVEN ROAD VEHICLES

Iliya Goldenfeld, Jerusalem, Israel, assignor to Kibbutz Gordonia Hulda, Mobile Post Ayalon, Israel

Filed Mar. 11, 1985, Ser. No. 710,083
Claims priority, application Israel, Mar. 14, 1984, 71233
Int. Cl.[4] B60K *1/00*; B62M *23/02*; B62K *11/00*
U.S. Cl. 74—625 6 Claims



1. An electric auxiliary drive for a pedal-driven road vehicle comprising:

an electric motor;

a rechargeable multicell battery to power said motor;

switch means to control said motor, which motor is adapted to operate in a first mode in which it functions as a mover, drawing energy from said battery and imparting it to said vehicle, and in a second mode in which it functions as a generator, drawing energy from said vehicle and imparting it to said battery;

first transmission means to provide a kinematic connection between said motor and the pedal axle of said vehicle for the moving thereof when operating in said first mode;

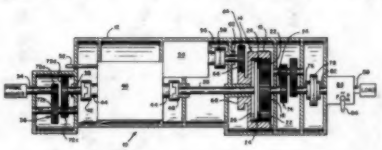
second transmission means to selectively provide a kinematic connection between one wheel of said vehicle and said motor, to enable said motor to operate in said second mode, wherein at least said first transmission means are positive transmission means, and wherein, when operating in said second mode as generator, said motor is adapted to rotate at a speed substantially higher per revolution of said vehicle wheel, than when operating in said first mode as mover.

4,637,275

TORQUE FEEDBACK TRANSMISSION

Brian L. Whalen, 102 New York Ave., Smithtown, N.Y. 11787

Filed Sep. 12, 1984, Ser. No. 649,691
Int. Cl.[4] F16H *47/04*
U.S. Cl. 74—687 1 Claim



1. An infinitely variable transmission of inline configuration for interconnecting a prime mover with a load for clutch free

operation in a range of speed including hydraulic neutral comprising:

a. planetary gear train means having a ring gear, a plurality of planetary gears supported by a planetary gear carrier, and a sun gear, said sun gear being connected mechanically to said load, output shaft means for joining said said sun gear to said load;

b. variable torque feedback means comprising (i) a variable displacement hydraulic motor whose rotor shaft is in line with said output shaft means and drivingly connected to said prime mover and said planetary gear carrier during the full range of operation of said transmission, and (ii) a fixed displacement hydraulic pump connected hydraulically to said motor, the rotor shaft of said pump being connected mechanically to said ring gear and being axially displaced from said output shaft means

c. means for adjusting the displacement volume within said hydraulic motor for controlling the torque feedback in said transmission to provide infinitely variable coupling between said prime mover and said load over the full range of said transmission including hydraulic neutral;

d. a speed reducer between said prime mover and said motor rotor shaft and a speed multiplier between said sun gear and said load; and

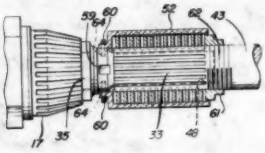
e. mechanical transmission assembly means between said speed multiplier and said load in line with said motor rotor shaft and said output shaft means for providing selection of drive, reverse, park, and neutral.

4,637,276

SINGLE GEAR-PAIR VEHICLE DIFFERENTIAL

Robert J. Holan, 4508 52nd St., and Kelly D. Lindsey, 4513 51st St., both of Drayton Valley, Alberta, Canada (T0E 0M0)

Filed Nov. 23, 1984, Ser. No. 674,263
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—713 **4 Claims**



1. An apparatus for transforming rotary power conveyable into said apparatus by a drive shaft to rotary power to at least two wheels of a vehicle comprising:

(a) a driving gear coupleable to an input power drive shaft,

(b) a driven gear meshing with said driving gear,

(c) a first half axle rigidly coupled to said driven gear,

(d) a second half axle colinear with said first half axle,

(e) means for rotatably supporting said driving gear and intermediate longitudinal portions of said first and second half axles,

(f) means for rotatably supporting inner facing portions of said first and second half axles in coaxial alignment, said means comprising a coaxial, cylindrical cavity extending perpendicularly inward from an inner face of one of said first and second half axles, and a constricted diameter inner end of said other half axle adapted to fit insertably and rotatably within said cavity, and

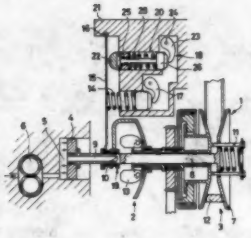
(g) means for slippably connecting said inner facing ends of said first and second half axles.

4,637,277

DEVICE FOR CONTROLLING THE REGULATION IN AN AUTOMATIC TRANSMISSION

Bruno Gaddi, Pisa, Italy, assignor to Piaggio & C. S.p.A., Genoa, Italy

Filed Oct. 12, 1984, Ser. No. 660,398
Claims priority, application Italy, Oct. 17, 1983, 23325 A/83
Int. Cl.[4] B60K *41/14*; F16H *11/06*
U.S. Cl. 74—865 **3 Claims**



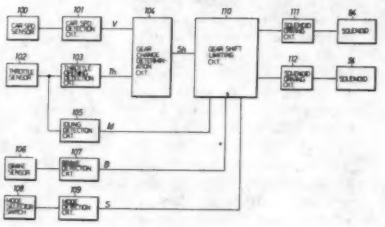
1. A transmission system for continuously varying a transmission ratio between a vehicle engine and its wheels, including a pulley comprising a pair of half pulleys, an operating element arranged to vary the transmission ratio, a shaft in communication at one end to the operating element and at the other end to means for displacing said shaft, a speed regulator mounted on the shaft comprising centrifugal masses and an axially displaceable regulator collar, a first lever in communication at one end with the regulator collar, a first yieldable member preloaded by a second lever connected to an engine feed control which provides a force on the regulator collar through the first lever in opposition to a speed dependent force exerted on the regulator collar by the centrifugal masses, the improvement comprising a second yieldable element preloaded by a manually controlled means connected to said second yieldable element providing a force on the regulator collar through the first lever independent of the force of the first yieldable member so as to oppose the influence of an engine speed thereby maintaining the transmission system at its lowest ratio.

4,637,278

GEAR SHIFT CONTROLLER FOR AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo; Shinzo Sakai, Saitama, and Yoshimi Sakurai, Tanashi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,145
Claims priority, application Japan, Dec. 7, 1982, 57-214503
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 **5 Claims**



1. A gear shift controller for an automatic transmission having a gear shift, comprising:

a hydraulic torque converter;

a gear change group, having a plurality of gears, each gear providing a different transmission ratio for the transmission of power from said hydraulic torque converter to the output of the transmission, each of said gears comprising a gear train;

a one-way clutch interposed in at least one of said gear trains;

a plurality of clutch means operatively connected with said gear trains for actuating each of said gear trains selectively;

a gear change determination circuit operatively connected with said clutch means to control the operation of each of said clutch means according to a predetermined gear-shifting program for engaging a gear train selected by the program;

a coasting detection circuit for detecting a car in the coasting state;

a gear shift limiting circuit, operatively connected with said gear change determination circuit and with said coasting detection circuit, for actuating only said gear train in which said one-way clutch is interposed immediately, regardless of the selected gear train and of the operation of said gear change determination circuit, when said coasting detection circuit has determined the car to be coasting; and

an operation transfer control system including a brake operation detecting means and a mode selector switch means for transferring the operation of the gear shift limiting circuit, said operation transfer control system being adapted to stop, upon detection of one of said brake operation and a reset state of said mode selector switch, the operation of said gear shift limiting circuit and to place said plurality of clutch means under the control of said gear change determination circuit.

4,637,279

METHOD FOR CONTROLLING A CONTINUOUSLY VARIABLE TRANSMISSION

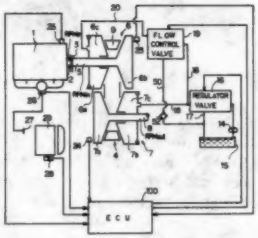
Hiroshi Itoh, and Mitsuru Takada, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 574,739, Jan. 30, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 840,542

Claims priority, application Japan, Feb. 7, 1983, 58-17551

Int. Cl.[4] B60K *41/12, 41/18*

U.S. Cl. 74—866 **15 Claims**



1. A method for controlling a continuously variable transmission for motor vehicles, having an input shaft for connecting an engine to a continuously variable transmission, a driving pulley mounted on the input shaft, said driving pulley including a non-movable member and a movable member, the movable member being actuated by an hydraulic cylinder to form a V-shaped opening between the non-movable and the movable member, an output shaft, a driven pulley mounted on the output shaft, said driven pulley including another non-movable member and another movable member, the another movable member being similarly actuated by another hydraulic cylinder to form another V-shaped opening between said another non-movable member and said another movable member, a flexible belt member spanning said pulleys, and a memory means; comprising the steps of:

storing data representative of a plurality of discrete relationships between openings of a throttle valve and optimum numbers of revolutions per minute of said input shaft in said memory means, each of said plurality of relationships corresponding to an actual vehicle speed;

detecting an actual opening of said throttle valve which is proportional to an amount of fuel injected into an engine;

detecting an actual number of revolutions per minute of said input shaft;

detecting an actual vehicle speed;

determining an optimum number of revolutions per minute of said input shaft from said plurality of discrete relationships stored in said memory, whereby for each said actual vehicle speed detected, one of said plurality of discrete relationships is chosen, and for said actual throttle opening detected, an optimum number of revolutions per minute is selected;

comparing the detected actual number of revolutions per minute of said input shaft with said selected optimum number of revolutions per minute of said input shaft; and

controlling an amount of hydraulic fluid injected into the hydraulic cylinders, in accordance with the comparison between said actual and desired number of revolutions per minute of said input shaft, to achieve said optimum rotation speed.

4,637,280

CONTROL SYSTEM FOR MOTOR VEHICLE WITH CONTINUOUSLY VARIABLE TRANSMISSION AND ENGINE

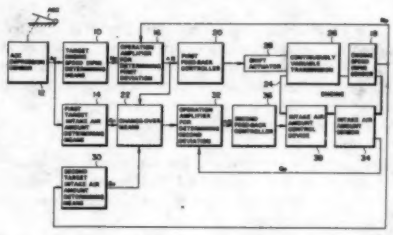
Katsunori Oshiage, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 31, 1985, Ser. No. 760,766

Claims priority, application Japan, Aug. 3, 1984, 59-162893

Int. Cl.[4] B60K *41/12, 41/18*

U.S. Cl. 74—866 **4 Claims**



1. A control system for a motor vehicle having an accelerator, an engine, a device to adjust combustible charge admitted to the engine, and a continuously variable tranmission operatively associated with the engine such that the engine speed varies by effecting shifting in reduction ratio in the continuously variable transmission, said control system comprising:

an accelerator sensor coupled with the accelerator for detecting depression degree of the accelerator and generating an accelerator sensor signal indicative of the detected depression degree of the accelerator;

an engine speed sensor operatively associated with the engine for detecting engine speed of the engine and generating an engine speed sensor signal indicative of the detected engine speed;

means coupled with said accelerator sensor for generating a target engine speed indicative signal indicative of a target engine speed which is a predetermined function of depression degree of the accelerator;

means coupled with said engine speed sensor and said target

engine speed indicative signal generating means for generating a deviation indicative signal indicative of a deviation between the detected and target engine speeds and controlling shifting in reduction ratio in the continuously variable transmission in such a manner as to decrease said deviation toward zero;

means responsive to said deviation indicative signal for selectively generating, as an output signal, a first target value which is a predetermined function of depression degree of the accelerator or a second target value which is a predetermined function of engine speed of the engine; and

means responsive to said output signal for actuating the device in such a manner that the engine produces horse power indicated by said output signal.

4,637,281

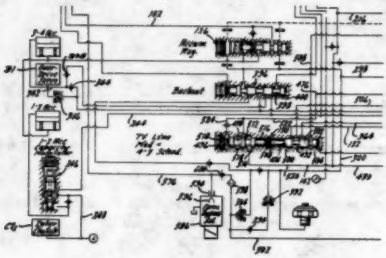
CONTROL VALVE SYSTEM FOR A FOUR-SPEED AUTOMATIC POWER TRANSMISSION TRANSAXLE

Joseph S. Vanselous, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 19, 1985, Ser. No. 756,629

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—869 **6 Claims**



1. In a control system for an automatic transmission for an automotive vehicle, said transmission having a torque input shaft, a torque output shaft, a hydrokinetic torque converter with an impeller connected to the torque input shaft and a turbine, and multiple ratio gearing having an input element connected to said turbine and an output element connected to said output shaft;

first clutch and brake means for controlling the relative motion of the elements of said gearing to establish and disestablish ratio changes between a fourth speed ratio and a third speed ratio;

Second clutch and brake means for controlling the relative motion of the elements of said gearing to establish and disestablish ratio changes between a second speed ratio and said third speed ratio;

third clutch and brake means for controlling the relative motion of the elements of said gearing to establish and disestablish ratio changes between a first speed ratio and said second speed ratio;

fluid pressure actuators for each of said clutch and brake means;

a fluid pressure pump;

conduit structure connecting said pump and said actuators including a 1-2 shift valve means for controlling selectively distribution of actuating pressure to the actutor for said third clutch and brak means, a 2-3 shift valve means for controlling selectively distribution of actuating pressure to the actuator for said second clutch and brake mans and a 3-4 shift valve means for controlling selectively distibution of actuating pressure to the actuator for said first clutch and brake means;

a source of a pressure signal proportional in magnitude to input torque and a source of a pressure signal proportional in magnitude to output shaft speed;

said signal sources being in communication with said shift vale means;

a backout valve means for controlling the rate of response of the actuators to shifting of said 2-3 shift vale means to a third speed ratio condition from a second speed ratio condition, said backout valve means comprising a backout valve element in said conduit structure that is movable from a first position to a second position, said torque signal source communicating with said backout valve element whereby the latter is urged to its second position;

flow control orifices in said conduit structure communicating with said backout valve means in parallel relationship, one with respect to the other, said orifices being located in the pressure distribution path of said conduit structure position that feeds said second clutch and brake means;

both control orifices being effective to control actuator pressure for said second clutch and brake means when said backout valve element assumes its second position and one orifice being effective to control actuator pressure for each second clutch and brake means when said backout valve element assumes its first position.

4,637,282

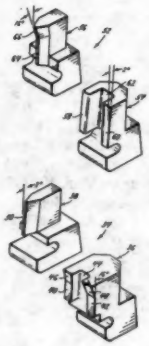
METHOD OF MAKING CLEAR DIES FROM BAR STOCK

Frank Gray, 3146 Lin-Tel Rd., St. Louis, Mo. 63125, and Clyde M. Hardin, Jr., 1400 S. Main St., DeSots, Mo. 63020

Filed Apr. 13, 1984, Ser. No. 599,963

Int. Cl.[4] B21K *5/20*

U.S. Cl. 76—4 **12 Claims**



1. A set of tools for making bends in thin bar stock with wide sides, the tools comprising a female tool having a sloped face for supporting the bar stock and a vertical tapering slot in the face, and a male tool having a sloped bending-edge aligned with the slot to push the bar stock into the slot and bend the bar stock.

4,637,283

CORKSCREW DEVICE

Leo Bertram, Stolberg, Fed. Rep. of Germany; Romuald L. Bukoschek, and Peter Steiner, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1985, Ser. No. 738,131

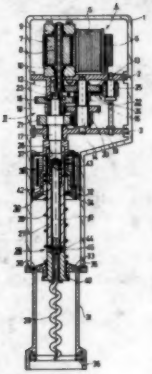
Claims priority, application Austria, Jun. 1, 1984, 1808/84

Int. Cl.[4] B67B *7/04*

U.S. Cl. 81—3.2 **16 Claims**

1. A corkscrew which comprises a sleeve coaxial with a corkscrew sprial and formed to cooperate with a bottleneck provided with a cork, the corkscrew sprial being capable of being screwed into the cork in one direction of rotation with

the cork being drawn from the bottleneck without the direction of rotation being reversed; a self-starting two-pole single-phase synchronous motor with a diametrically magnetized permanent-magnet rotor for driving the corkscrew spiral; a reduction gear positioned between the motor and the corkscrew sprial and driven by the motor, the reduction gear providing a reduction ratio of 60:1 to 100:1 a reversible unidirectional latch for defining the direction of rotation of the motor, said unidirectional latch cooperating with a part of the reduction gear driven by the motor with an integral reduction ratio; a lead-screw connected to the corkscrew spiral and having a



pitch opposite to the pitch of the corkscrew spiral, said lead-screw being driven by the reduction gear; a lead-screw nut cooperating with the lead-screw near the reduction gear, the sleeve being arranged on said lead-screw near the corkscrew spiral so as to be retained and to be slidable freely, the facing sides of the lead-screw nut and the sleeve being provided with abutment surfaces cooperating with each other during removal of the cork from the bottleneck when the lead-screw nut moves along the lead-screw; and means to reverse the blocking direction of the unidirectional latch to select one of the two directions of rotation of the motor.

4,637,284

RATCHET-ACTION OPEN-END WRENCH

Martin J. Rosenbaum, P.O. Box 2402, Bridgeport, Conn. 06606

Filed Sep. 3, 1985, Ser. No. 771,635
Int. Cl.[4] B25B *13/12*
U.S. Cl. 81—179 **3 Claims**

1. A ratchet-action open-end wrench comprising, in combination:

(a) an elongate handle having a pair of jaws at one end which have nut-engageable faces and are adapted to grasp opposite faces of an hexagonal nut when the handle is moved forward,

(b) one of said jaws being movable with respect to said handle,

(c) cooperable slide mounting means including interfitting dovetail sliding portions of said movable jaw and handle, said dovetail sliding portions having a predetermined direction of relative movement for guiding said movable jaw to enable the entire said jaw to shift with translational movement along an oblique path on said handle end and to have essentially translational movement between a closed nut-gripping and nut-driving position located towards but spaced from said other jaw and an open, nut-releasing position located further away from said other jaw, said slide-mounting means having a reasonably loose fit to enable a limited rocking movement of the movable jaw to

(d) means biasing said movable jaw towards its closed nut-gripping position,

(e) cooperable, separable interfitting means on said movable jaw and handle, tending to resist shifting of the movable jaw from its closed, nut-gripping position, and

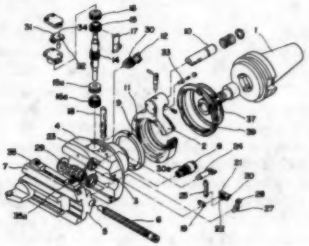
(f) a pivot pin rigidly carried by said movable jaw, said handle having a slot in one of said dovetail portions, extending generally parallel to the direction of relative movement of said portions, and said pivot pin being received and movable in said slot to enable the movable jaw to pivot as a result of application of pressure from the nut thereon, causing separation of said interfitting means and translational shifting of the movable jaw by said nut toward said nut-releasing position.

4,637,285

AUTOMATIC FEED DEVICE FOR A FACING HEAD

Hideo Mizoguchi, 1249-1, Ohaza Ueki, Nogata-shi, Fukuoka-ken, Japan

Filed Jul. 26, 1985, Ser. No. 759,637
Claims priority, application Japan, Aug. 6, 1984, 59-165343
Int. Cl.[4] B23B *29/034*
U.S. Cl. 82—2 E **9 Claims**



1. In a facing head operable with a shank mounted on a main shaft of a machine tool, comprising a body fixed in coaxial relation to the shank and having dovetail slots extending in a direction normal to the axis of the main shaft, a tool holder slidably fitted to the body through the dovetail slots, and an operating ring fitted between the shank and the body and fixed to said machine tool, said operating ring having an internal stationary gear and also having feed pins projecting from an end face of the operating ring, an automatic feed device for automatically moving said tool holder in a radial direction during rotation of the main shaft, said automatic feed device comprising a worm shaft disposed centrally of the body and extending in a direction normal to the axis of the main shaft and the dovetail slots, clutches and worm wheels rotatably fitted to both ends of the worm shaft respectively and arranged in diagonally opposite relation to the axis of the worm shaft, worm elements meshing with the corresponding worm wheels, a gear arranged in coxial relation to one of the worm elements and meshing with said stationary gear provided at the inner periphery of the operating ring, a feed gear arranged in coaxial relation to the other worm element and operable to engage said feed pins projecting from the end surface of the operating ring,

an internally threaded worm wheel fitted centrally to the body and meshing with the worm shaft, a feed screw fitted in the tool holder and arranged in parallel relation to the dovetail slots, said feed screw being threadably engaged with the internally threaded worm wheel, a shifter connected simultaneously to the two clutches and being free to slide in a direction parallel to the axis of the worm shaft, a shifter driving shaft engaged with the shifter, said shifter driving shaft being slidable and having an elongated slot therein, a shift lever constituting a cam and having a tapered slot, a forked connecting member pivotally connected to the shifter driving shaft via a pin and received in the tapered slot, a press lever biased by a compression spring and operable to press a cam roller against the cam, and a feed direction detecting lever arranged at the end surface of the body in parallel relation to the axis thereof and connected via a joint to the shift lever.

4,637,286

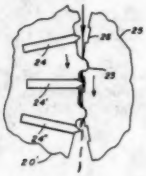
STAPLE CUTTING FOR FIBER REINFORCEMENT MATERIAL

Beryl A. Boggs, Richmond, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 633,835, Jul. 24, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,365

Int. Cl.[4] D01G *1/04*

U.S. Cl. 83—175 **11 Claims**



1. In an apparatus for cutting elongated material into predetermined lengths comprising a rotatable cutting roll having a plurality of radially extending cutting blades, and a cooperating second roll, said rolls rotating in opposite directions and between which said elongated material passes, the improvement comprising: a plurality of projections radially extending from said cutting roll, at least one of said projections being located on each side of a cutting blade and extending further radially from said cutting roll than said blades, said second roll having an elastic material at its periphery which is engaged by said projections in succession to compress the elongated material therebetween.

4,637,287

DIMPLELESS TUBE CUTTING APPARATUS

Mitsuo Kusakabe, Kobe, Japan, assignor to Kusakabe Electric & Machinery Co., Ltd., Japan

Filed Apr. 3, 1984, Ser. No. 596,437

Claims priority, application Japan, Apr. 26, 1983, 58-74700; Jul. 6, 1983, 58-123967

Int. Cl.[4] B23D *21/00, 25/04*

U.S. Cl. 83—319 **9 Claims**

1. A machine for the dimpleless cutting of tubing, comprising:

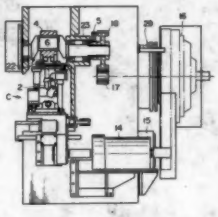
a frame;

a cutting assembly mounted for movement with respect to said frame together with a section of tubing to be cut;

means for moving said cutting assembly with respect to said frame; and

an actuator for said cutting assembly;

said actuator for said cutting assembly comprising: a ram supported on a plurality of crankshafts, said crankshafts having their axes parallel to one another and their crank throws in phase with one another, one of said crankshafts being a driven crankshaft and the others of said crankshafts being follower crankshafts, each of said crankshafts being mounted to said frame by bearing means allowing said crankshafts to rotate about axes fixed with respect to said frame, and each of said crankshafts comprising a crank throw and a crank pin, each said follower crankshaft further comprising a synchronizing arm attached to



the crank pin of said follower crankshaft and forming an angle with the throw of said follower crankshaft; and

synchronizing link means connecting said synchronizing arms to one another, for constraining said follower crankshafts to rotate in phase with one another and with said driven crankshaft.

4,637,288

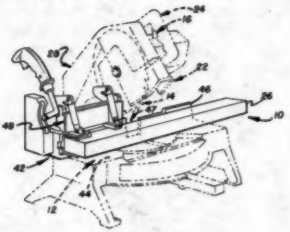
SAFETY MECHANISM FOR SAWS

Joseph C. Olsen, Sunnyvale, and Richard H. Steinbach, Santa Clara, both of Calif., assignors to Engineering Consulting Services, San Jose, Calif.

Filed Dec. 18, 1985, Ser. No. 811,016

Int. Cl.[4] B27G *19/02;* B27B *5/38*

U.S. Cl. 83—375 **8 Claims**



1. In a sawing apparatus having a workpiece work support structure and an operator moveable electrically powered saw blade having a first normally biased off switch controlling application of electric power thereto, said switch being positioned to be controlled by a hand of an operator which controls movement of the saw blade, an improvement comprising:

a device adapted for gripping, positioning and clamping a workpiece relative to said workpiece work support structure; and

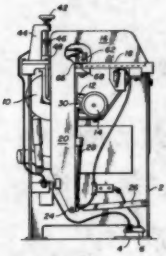
a second normally biased off switch connected in series with said first normally biased off switch, said second switch being positioned to be controlled by the off hand of the operator while the off hand is utilizing said device.

4,637,289

WORK PRESENCE CONTROLLER

Gordon Ramsden, Dallas, Tex., assignor to Whirlwind, Inc., Dallas, Tex.

Filed Nov. 2, 1984, Ser. No. 667,583
Int. Cl.[4] B26D 5/42
U.S. Cl. 83—380 12 Claims



1. In a saw having a frame where an arbor is mounted to drive a circular saw blade from below a flat work surface upward through a slot therein to sever any work piece suitably disposed on said work surface and wherein a guard/clamp above said surface is lowered to engage and clamp each such work piece on said work surface before said saw blade begins its ascent, the guard/clamp having a vertical stem extending through the work surface below the surface, an anchor bracket pivotally connected between the frame and the vertical stem to guide the guard/clamp for vertical movement relative to the work surface, the combination which comprises:

a foot pedal mounted at the base of the saw for initiating and terminating a cutting cycle of the saw;

a single, double-action pneumatic cylinder connected to said guard/clamp and said arbor which lowers said guard/clamp guided by the vertical stem and anchor bracket and then raises said saw blade at initiation of said cutting cycle and which lowers said saw blade and then raises said guard/clamp at termination of said cutting cycle;

a sensor mounted on said guard/clamp to sense the presence of a work piece on said work surface; and

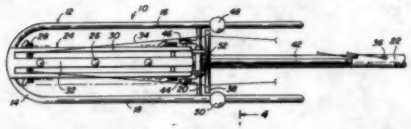
means responsive to said sensor to prevent initiation of said cutting cycle when said sensor fails to establish the presence of said work piece on said work surface.

4,637,290

VARIABLE PITCH HARP

Robert S. Grawi, 655 - 6th Ave., Rm. 215, New York, N.Y. 10010

Filed Oct. 4, 1985, Ser. No. 784,617
Int. Cl.[4] G10D 3/04
U.S. Cl. 84—173 10 Claims



1. A variable pitch harp, comprising in combination:

(a) a U-shaped frame, made of a rigid material, with elongated parallel arms;

(b) a rigid bowed cross member which spans said elongated parallel arms and is perpendicular to said arms such that said U-shaped frame is strengthened;

(c) an elongated member connected to said U-shaped frame at the center of the curved section of said U-shaped frame such that said elongated member is equidistant from said parallel arms and lies in a plane which forms an acute angle with the plane of said parallel arms; wherein said elongated member also contains a multiplicity of string anchor apertures to which strings may be attached;

(d) a head, made of an acoustical semi-resilient material such as wood, wherein said head is attached to the upper surface of said elongated member and is located in the region between the curved section of said U-shaped frame and said rigid cross member; whereby said head comprises a center support section and two tuning device supports each adjacent to said center support;

(e) a multiplicity of strings;

(f) a multiplicity of string tuning devices which are used to adjust the tension on each of said multiplicity of strings, whereby each of said strings is attached to said elongated member at one of said string anchor apertures while the other end of said string is attached to said string tuning device, such that the invention may be tuned prior to playing;

(g) a bridge, located between said string tuning devices and said string anchor apertures, with a multiplicity of notches through which pass each of said strings such that each string is separated from every other string while still being held under tension; and,

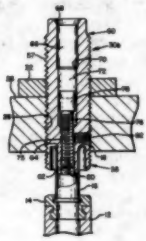
(h) a variable pitch tensioning arm, pivoted in a vertical plane relative to the plane of said parallel arms on a pivot consisting of at least one pivot arm connected perpendicularly to said cross member and a pivot pin; wherein said tensioning arm is forked with the opening at the pivot points, such that said bridge spans the opening of said fork, such that when said tensioning arm is raised said bridge is also raised, thereby increasing tension on all of said strings and raising the pitch of the emitted sounds when such strings are bowed, plucked or struck.

4,637,291

COMBINATION AMMUNITION RELOADING DIE

Kenneth L. Alexander, Oroville, Calif., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Feb. 10, 1986, Ser. No. 827,864
Int. Cl.[4] F42B 33/10, 33/00
U.S. Cl. 86—23 6 Claims



1. A combination ammunition re-loading die adapted to be threadedly mounted to the die holder of an ammunition reloading apparatus comprising; an elongated housing having first and second ends, an outer threaded surface formed at each of said first and second ends whereby said housing can be threadedly mounted to the die holder by the selective insertion of the first and second ends, a cartridge mouth expander post provided at said first end adapted to engage and flare open the mouth of a cartridge held in the reloading apparatus, the second end of the housing having a cartridge receiving opening extending inwardly through the housing to said post at said first end, said post having a shaft receiving threaded opening forming a continuation of the cartridge receiving opening in the second end, a shaft screwed into said post opening with an end portion positioned in said second end opening, a cartridge reloading member provided on said end of the shaft and positioned in said second end opening of the housing, said cartridge

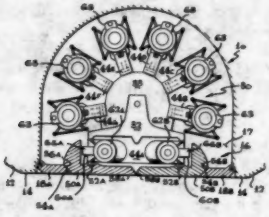
reloading member being adjustably positioned within said second end opening of the housing by screwing the shaft into and out of the post opening, and locking means to lock the shaft at a desired position in the post opening.

4,637,292

ROTARY LAUNCHER SYSTEM FOR AN AIRCRAFT

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 23, 1985, Ser. No. 812,565
Int. Cl.[4] F41F *3/06*
U.S. Cl. 89—1.804 **4 Claims**



1. A rotary launcher system for an aircraft having a weapon bay, the weapon bay having an opening in communication with the exterior of the aircraft, the system comprising:

a plurality of first doors mounted on the aircraft movable from an open position to a closed position sealing off a portion of the opening and forming a portion of the external contour of the aircraft over the opening;

a frame member rotatively mounted within the weapon bay;

at least one first weapon mounting assembly mounted to said frame member alignable with the opening upon rotation of said frame member, said at least one first weapon mounting assembly adapted to mount at east one missile;

a second weapon mounting assembly mounted to said frame member alignable with the opening upon rotation of said frame member, said second mounting assembly comprising;

a pair of second door means rotatively mounted to said frame member, said pair of second door means movable from an open position to a closed position wherein said second door means seals off the remaining portion of the opening and form the remaining portion of the external contour of the aircraft over the opening, when said second weapons mounting assembly is aligned with the opening; and,

a missile dispensing assembly mounted to at least one of said second door means for moving the missile from a retracted position to an extended position wherein the missile can be launched when said door means is in said open position.

4,637,293

SLANT PLATE TYPE HYDRAULIC DEVICE

Kouji Yamaguchi; Eiichiro Kawahara, both of Tokorozawa, and Noboru Yamamoto, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,390
Claims priority, application Japan, Nov. 14, 1984, 59-239967
Int. Cl.[4] F01B *13/04*; F01M *1/00*
U.S. Cl. 91—507 **11 Claims**

1. A slant plate type hydraulic device comprising:

a casing;

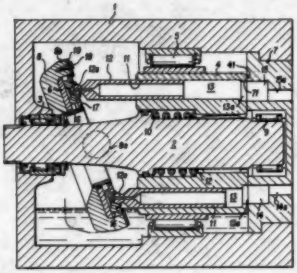
a cylinder block rotatably mounted in said casing and having a plurality of axial bores;

a slant plate arranged to face said cylinder block and to rotate relative to the same;

a multiplicity of plungers arranged in an annular array around said axis to freely slide in said bored in the axial direction of said cylinder block;

a slant plate holder mounted in said casing and supporting said slant plate; and

a shoe attached to the leading end of each of said plungers and held in sliding contact with said slant plate, the improvement comprising said slant plate having a lubricant chamber enclosing the sliding contact portions of said



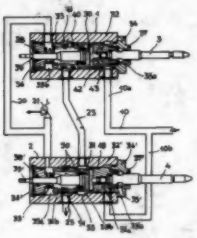
slant plate and said shoes to confine lubricating oil therein, a press plate having a plurality of through holes being rotatably mounted on said slant plate holder, said shoes and said leading ends of said plungers extending through said through holes, and an axially extending cylindrical partition being provided on an inner circumference of said slant plate holder, said press plate and said partition together with said slant plate holder defining said lubricant chamber.

4,637,294

DEVICE FOR CONTROLLING THE SUPPLY OF FLUID UNDER PRESSURE TO A HYDRAUIC CIRCUIT AS A FUNCTION OF THE STATE OF LOCKING OF UNLOCKING OF TWO MECHANICAL MEMBERS

Yves Huet, Versailles, and Christian Perichon, Boulogne-Billancourt, both of France, assignors to Framatome & Cie, Courbevoie, France

Filed Dec. 14, 1984, Ser. No. 681,467
Claims priority, application France, Dec. 16, 1983, 83 20234
Int. Cl.[4] F15B *13/00*; F01L *15/00*; G21C *13/00*; F16K *37/00*
U.S. Cl. 91—536 **4 Claims**



1. A device for controlling the supply of fluid under pressure to a hydraulic circuit as a function of the state of locking or unlocking of two mechanical members, said device comprising

(a) a first hydraulic jack (1) having an inlet end and an outlet end the chamber of which contains a piston (30) provided with at least one sealing ring (40), so as to separate the chamber (35) into two parts (35*a* and 35*b*), the first (35*a*) of which is connected to a pipe (10*a*) situated at the inlet end of the jack for the inflow of fluid under pressure into the jack (1), and the second (35*b*) of which is connected to

a depressurizing pipe (20) situated at the outlet end of the jack, the piston (30) being, on one side, integrally fixed to a rod (3) connected to one of said two mechanical members and, on the other side, returned by a first spring, the mechanical member being locked or unlocked respectively because the piston (30) is blocked in position toward the inlet end of the jack (1) or is released;

(b) a second hydraulic jack (2) having an inlet end and an outlet end, the chamber (35') of which contains a piston (31) which incorporates two parts (31*a* and 31*b*) spaced in the axial direction of the jack and which is provided with at least two sets of sealing rings (49, 50), so as to divide the chamber (35') into three parts (35'*a*, 35'*b*, 35'*c*), the first (35'*a*) of which, located at the inlet end of the jack (2), is connected to a pipe (10*b*) for the inflow of fluid under pressure into the jack (2), and the third (35'*c*), located at the outlet end of the jack (2), is connected to a depressurizing pipe (20), the piston (31) being on one side integrally fixed to a rod (4) connected to the second of the two mechanical members and on the other side returned by a second spring, the locking or unlocking being ensured respectively because the piston (31) is blocked toward the inlet end of the jack (2) or is released;

(c) an interconnecting pipe (23) joining center parts of the chambers (35, 35') of the two jacks (1,2) to each other, said center parts being located between the inlet and outlet ends of the respective jacks;

(d) a pipe (25) for supplying fluid under pressure to the hydraulic actuating circuit, in communication with the chamber (35') of the second jack (2) in a zone located between said interconnecting pipe (23) and the outlet end of said second jack;

(e) the piston (30) of the first jack (1) having, in its blocked position toward the inlet face of the jack (1) under the effect of th first spring, a position such that the interconnecting pipe (23) communicates with the second part (35*b*) of the chamber of the jack (1), said piston (30) being capable of being displaced, when released, toward the outlet end of the jack (1), in such a way that the interconnecting pipe (23) then communicates with the first part (35*a*) of the chamber of the jack (1), the piston of the second jack (2) having, in its blocked position toward the inlet end of the jack (2) under the effect of the second spring, a position such that the interconnecting pipe (23) opens into the second part of the chamber (35') of the jack (2) and the pipe (25) supplying the hydraulic circuit opens into the third part (35'*c*), while this piston (31) of the second jack (2) can be displaced when released, toward the outlet end of the jack (2), in such a way that the interconnecting pipe (23) and the pipe (25) supplying the hydraulic circuit then communicate with the second part (35'*b*) of the chamber of the jack (2).

4,637,295

PUMP SEAL WITH CURVED BACKUP PLATE

Frederick A. Powers, 10549 Lancaster La., Maple Grove, Minn. 55369, and Thomas J. Gustafson, 8411 Toledo Ave. N., Brooklyn Park, Minn. 55433

Filed Apr. 9, 1985, Ser. No. 721,872

Int. Cl.[4] F01B *11/02;* **F04B** *7/04;* **F02F** *11/00*

U.S. Cl. 92—170 **5 Claims**

1. A pump for fluent materials and especially suitable for moving heavy fluent and abrasive materials, comprising:

a housing member providing a hollow cylinder chamber receptive of material to be pumped and having an axially extending chamber wall and opposite ends;

a piston within and shorter than the cylinder chamber and having its perimeter of smaller diameter than and in limited spaced gap relation to said wall so that material can flow through the gap;

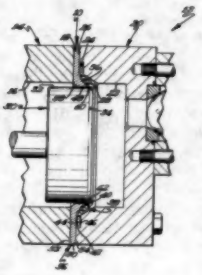
a closure at one end of the cylinder chamber and means for guiding a piston rod of the piston for axial forward and return strokes of the piston relative to the opposite end of the cylinder chamber;

a means for driving the piston rod and thereby the piston in said forward and return strokes;

a closure member and means securing the closure member to said housing member in closing relation to said opposite end of the cylinder chamber, and said closure member having a blind end chamber which forms a forward extension from the cylinder chamber and into which the piston extends a limited distance in the forward stroke of the piston, said blind end extension chamber being of a diameter which is larger than the diameter of the piston perimeter so that there is a limited spaced gap relation between the piston perimeter and said extension chamber when the piston extends into said extension chamber;

means for introducing into said cylinder chamber material to be pumped, and check valved means for receiving pumped material from said extension chamber;

a rigid annular ring plate clamped between said housing member and said closure member and having an inner annular rib portion which extends to an inner diameter smaller than the diameters of the cylinder chamber wall and the extension chamber wall but to a larger diameter than the piston perimeter diameter, said rib portion defining a port through which the piston moves freely when a



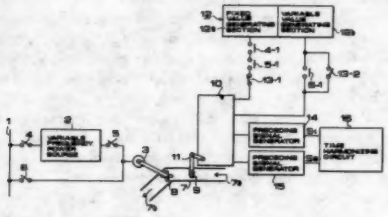
forward end of the piston is entirely within the cylinder chamber and clear of said rib portion; and

a combination valving, sealing and wiping elastic ring comprising a normally substantially flat elastic annular element fixedly clamped between said ring plate and said closure member and having an annular portion projecting radially inwardly beyond said rib portion to a substantially smaller diameter than the diameter of the piston perimeter, said elastic ring being engaged by the piston during the forward stroke through said rib portion and the piston elastically expanding the radially inwardly projecting portion of the elastic element into a tensioned sealing and wiping annular lip extending forwardly on the piston perimeter and maintaining pumping pressure in said blind end chamber against leakage past said rib flange during said forward stroke of the piston, the improvement comprising said ring plate having an outer diameter, first and second sides facing said housing and closure members, respectively, said first side being planar, said ring plate having a first thickness at said inner diameter and a second thickness less than said first thickness and said elastic ring being relatively soft such that said ring plate supports said elastic ring and urges said elastic ring into a generally frustro-conical shape, wherein said elastic ring comprises an elastomer having an ASTM type-A hardness of approximately 80 to 90.

4,637,296
AIR FLOW CONTROLLING APPARATUS

Yoshihiko Hirosaki, and Nobuharu Takata, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,949
Claims priority, application Japan, Jun. 27, 1983, 58-117511
Int. Cl.[4] F24F 7/00; H02J 9/06
U.S. Cl. 98—1 2 Claims



1. An air flow controlling apparatus of the type which includes a damper located in an air course, a ventilator for feeding a wind by way of said damper, an electric motor for driving said ventilator, a changing over means for alternatively connecting said electric motor to a commercial power source or a variable frequency power source, and a damper controlling means for controlling the opening of said damper to obtain a desired air flow, said air flow controlling apparatus comprising:

(a) a preceding controlling signal generating means responsive to an instruction to change over from said commercial power source to said variable frequency power source or vice versa for delivering a preceding controlling signal to said damper controlling means to vary the opening of said damper prior to operation of said changing over means; and

(b) a changing over time harmonizing means for rendering said changing over means operative after lapse of a predetermined period of time after delivery of the preceding controlling signal;

(c) said preceding controlling signal generating means including a first preceding controlling signal generator responsive to a changing over instruction to change over from said commercial power source to said variable frequency power source for delivering a first preceding controlling signal to said damper controlling means;

(d) said first preceding controlling signal having a value which can increase the opening of said damper in accordance with a predetermined function for a period of time from a point of time at which the changing over instruction to change over from said commercial power source to said variable frequency power source is received to another point of time at which said changing over means is rendered operative.

4,637,297
MEANS OF ISOLATING AUTOMOBILE BLOWER INTAKE FROM ENGINE COMPARTMENT AND EXHAUST FUMES

James G. Anneken, 6187 Kingoak Dr., Cincinnati, Ohio 45248

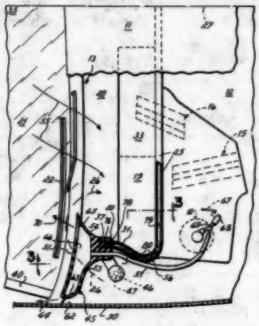
Filed May 13, 1985, Ser. No. 732,945
Int. Cl.[4] B60H 1/00
U.S. Cl. 98—2 14 Claims

1. In an automobile having a blower for delivering air into the passenger compartment, said blower having an air intake adjacent the curb side of the vehicle, said intake being beneath the hood and in front of the windshield, said automobile also having a tailpipe on the same side as said intake and a hood gasket which engages the underside of the hood in front of said intake;

a blower intake isolator for restricting the flow of engine compartment and exhaust fumes into said intake,

said isolator comprising an air flow deflector having an apex secured to said gasket, on the curbside of the blower intake,

said isolator having an outside face which curves rearwardly and outwardly from said apex to an outer corner located inwardly adjacent the curbside fender,



said isolator having an inside face which extends from said apex inwardly and rearwardly of the blower intake, diagonally toward the centerline of said automobile, and

a base extending between said faces and adjacent the windshield,

said outside face of said isolator deflecting engine compartment fumes outwardly and away from the blower intake,

said inside face of said isolator chaneling air to flow into said intake from a region above the centerline of the automobile.

4,637,298
WINDSHIELD DEFROSTER

Hayato Yoshikawa, and Manabu Morisaka, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 18, 1985, Ser. No. 724,545
Claims priority, application Japan, May 3, 1984, 59-65675[U]; Jul. 12, 1984, 59-145048
Int. Cl.[4] B60H 1/34
U.S. Cl. 98—2.08 10 Claims

1. A windshield defroster assembly, comprising:

a duct which conveys heated air from a heat source to a windshield, said duct having a first outlet, a second outlet, and an upper edge around the first outlet, said first outlet having an inner edge, said duct being installed in a vehicle dashboard having an aperture, a top surface, a bottom surface, and a hook, said first outlet being positioned closer to said dashboard top surface than said second outlet, said upper edge having first and second projections which project outwardly from said duct, said first projection being mounted on said hook, said second projection

being inserted in a recess in said bottom surface of said dashboard;

a vane positioned at said first outlet of said duct, said vane having a top edge, a bottom edge, and a control surface defined betwen said top and bottom edge, said vane being located at said first outlet such that said top edge of said vane extends through said dashboard top surface and out of the duct at said first outlet and said bottom edge of said vane remains within said duct near said first outlet, whereby heated ar conveyed through said duct from said heat source to said windshield follows along the control surface of said vane at the first outlet of said duct; and

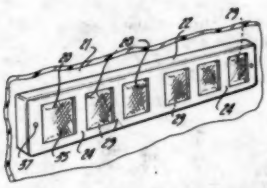
a bar crossing over said aperture, said bar being perpendicular to said top edge of said vane, said bar having two ends, each of said ends being secured to the top surface of said dashboard, and said bar having an intermediate portion, said intermeidate portion being secured to said top edge of said vane.

4,637,299

VENT OPENING FOR PORTABLE BUILDING WALL

George W. Harding, Clearwater, Fla., assignor to Poly-John Enterprises Corp., Whiting, Ind.

Filed Dec. 16, 1985, Ser. No. 809,307
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—29 **4 Claims**



1. A vent for an enclosure wall panel formed of a thin, somewhat resilient, but relatively stiff sheet of plastic, comprising:

aligned, spaced apart vent openings formed in the panel, with the openings each having an opposed pair of straight, longitudinal edges that are endwise aligned with the corresponding longitudinal edges of the next opening, and with a panel strip portion defining the space between the openings;

flanges formed integral with each of the opening longitudinal edges and terminating in integral flange strips, which strips are parallel and extend towards each other from the respective ends of their opposed flanges;

the junctures of each of the flanges and the panel edge portions defining their respective openings forming an acute angle so that the opposed flanges of each opening angle away from each other, and the juncture of the flanges and their integral free edge strips form an acute angle, so that the opposed flanges and flange strips in each opening provide opposing longitudinal channels and the channels of each opening are longitudinally aligned with the corresponding channels of the next opening;

a relatively stiff, vent cover sheet covering the openings and having longitudinal edges arranged within and frictionally held within their adjacent flange channels;

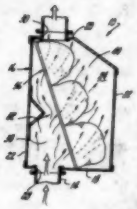
and fastening means securing the opposite transverse ends of the cover sheets to the panel.

4,637,300

FILTER ASSEMBLY FOR AN EXHAUST STACK

James Cole, Flushing, Mich., assignor to Dee Cramer, Inc., Flint, Mich.

Filed Nov. 4, 1985, Ser. No. 794,738
Int. Cl.[4] F01B *31/14*
U.S. Cl. 98—60 **8 Claims**



1. A filter assembly for an exhaust stack comprising:

a housing defining an interior chamber, said housing having an inlet and an outlet connected in series with the exhaust stack, said inlet and outlet being positioned on opposite ends of said housing,

a substantially planar mounting frame secured within said housing chamber so that a plane of said mounting frame extends diagonally across said housing chamber, said mounting frame extending entirely across said housing chamber so that said frame is interposed between said inlet and said outlet,

at least one filter element for removing particulate matter from air flow, and

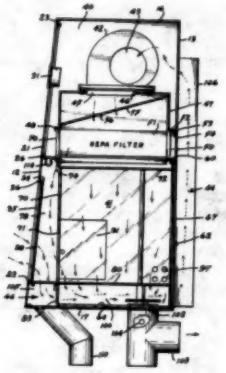
means for detachably securing said at least one filter element to said mounting frame so that substantially all of the air flow from said inlet and to said outlet passes through said filter.

4,637,301

CONTAMINATION CONTROL WORK STATION

William Shields, Los Alamos, N. Mex., assignor to Environmental Air Control, Inc., Hagerstown, Md.

Filed Feb. 6, 1984, Ser. No. 577,413
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.3 **5 Claims**



1. An apparatus for containing toxic fumes and hazardous substances comprising a cabinet having front, sides and rear walls and upper and lower interior portions, a first access opening in said cabinet communicating with said lower interior portion thereof, blower means mounted within said upper

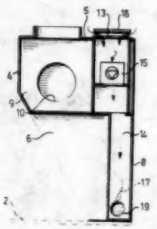
interior portion of said cabinet and having an inlet and a discharge, an enclosed ambient air intake passageway communicating said first access opening and said upper portion of said cabinet, a work area enclosure disposed below said blower means and within said lower interior portion of said cabinet, said work area enclosure being removably mounted as a unit within said lower interior portion of said cabinet, said work area enclosure including front, rear and side panel members which extend vertically from a work support surface member, said front panel member having a second access opening therein, a downdraft air passageway formed between said front wall of said cabinet and said front panel member of said work area enclosure, said work support surface member of said work enclosure having a central imperforate work area surrounded by a perforated portion, a filter means mounted between said discharge of said blower means and said work area enclosures so that air passing into said work area enclosure and said downdraft passageway passes first through said filter means, and a plenum chamber means mounted between said discharge of said blower means and said filter means, said plenum chamber means including a diffusion screen means for equalizing the airflow, across and into said filter means, an exhaust chamber beneath said work support surface member and substantially enclosed with respect to said ambient air intake passageway an outlet means for discharging air from said exhaust chamber.

4,637,302

AIR SUPPLY DEVICE

Helge Enberg, Enköping, Sweden, assignor to AB Bahco Ventilation, Sweden

Filed Aug. 16, 1985, Ser. No. 766,145
Claims priority, application Sweden, Aug. 20, 1984, 8404153
Int. Cl.[4] F25B *1/00*
U.S. Cl. 98—115.3 **9 Claims**



1. In an ejector air supply device for blowing ejector air into an exhaust hood;

said exhaust hood including an upper hood portion and a rear hood wall extending downwardly from said upper hood portion; an upper exhaust device being disposed in said upper hood portion for exhausting polluted air or other gases from the exhaust hood;

a casing located adjacent to said rear hood wall and provided with an elongated blow opening directed upwardly towards said upper exhaust device for entraining polluted air or other gases to be exhausted; the improvement wherein said casing is located at a position in front of and spaced from said rear hood wall and is in the form of an elongated substantially cylindrical body having an upper shield wall portion and an elongated blow opening between said wall shield portion and said rear hood wall;

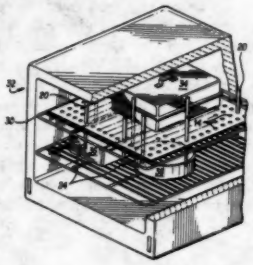
the lower and rear substantially cylindrical surface of said casing being spaced from said rear hood wall and any supporting structure so as to enable polluted air or other gases to flow about the underside and around the rear of the casing and to be entrained by the ejector air flow created by said blow opening between said shield wall portion and said rear hood wall.

4,637,303

COOKING RACK

Lloyd P. Lucky, P.O. Box 670803, Chugiak, Ak. 99567

Filed Mar. 25, 1985, Ser. No. 715,306
Int. Cl.[4] A47J *37/00*
U.S. Cl. 99—426 **16 Claims**



1. A cooking rack assembly for preventing relative motion of cooking utensils during cooking, said assembly comprising:

a plurality of pin means;

plate means positioned on a support means at a plurality of points to rigidly support said plate means relative to a cooking utensil;

a plurality of perforations on said plate means for receiving said pin means;

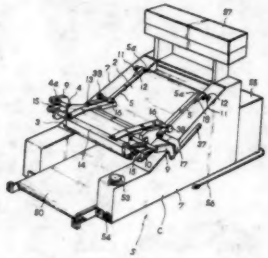
said pin means being selectively locatable on said plate means so that at least portions of said pin means extend outwardly from selected locations on said plate means for engaging said utensil and preventing said utensil from movement relative to said plate means, said pin means extending through said perforations so that a portion thereof extends from one side of said plate means and a portion thereof extends from the other side of said plate means.

4,637,304

METHOD OF MAKING MAKI-ZUSHI AND AN APPARATUS FOR MAKING MAKI-ZUSHI

Kisaku Suzuki, 19-8, Toshida 1-chome, Nerima-Ku, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,090
Claims priority, application Japan, Sep. 22, 1983, 58-176722; Dec. 28, 1983, 58-205168[U]
Int. Cl.[4] A23P *1/00*; B29C *69/00*
U.S. Cl. 99—450.2 **1 Claim**



1. An apparatus for producing maki-zushi which comprises in combination

(a) a flexible planar member that comprises a first section and a second section,

(b) means to initially support said first section in a generally horizontal position where it can receive a deposit of rice,

(c) means to initially support said second section in an inclined disposition that extends upwardly from said first section, said inclined second section supporting a sheet of nori,

(d) forming means to change said generally horizontal first section into a generally cylindrical cofiguration and to impart a rolling motion to said cylindrical configuration whereby an elongated cylindrical mass of rice will be formed from said rice deposit,

(e) rolling means to roll the elongated cylindrical mass of rice formed by the forming means upwardly over the surface of said upwardly inclined second section of said flexible planar member that has the sheet of nori supported thereon, whereby the elongated cylindrical rice mass produced by said forming means will be encased by said inclined sheet of nori,

(f) means to discharge said elongated cylindrical mass of rice encased by said nori sheet at the uppermost portion of said upwardly inclined first section and

(d) means to return said horizontal first section from said cylindrical configuration to said original generally horizontal support configuration.

4,637,305

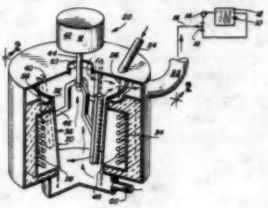
METHOD AND COMPOSITION FOR SMOKING COMESTIBLE PRODUCTS AND SMOKED PRODUCTS PRODUCED THEREWITH

Carroll L. Griffith, Hinsdale, and Albert E. Nielson, Naperville, both of Ill., assignors to Griffith Laboratories U.S.A., Inc., Alsip, Ill.

Division of Ser. No. 676,955, Nov. 30, 1984, Pat. No. 4,588,598. This application Nov. 27, 1985, Ser. No. 802,848

Int. Cl.[4] A23B *4/04*

U.S. Cl. 99—481 **20 Claims**



1. An apparatus for regenerating liquid smoke into vapor comprising:

a regenerator chamber;

a regenerator member having a generally vertical surface positioned within said chamber;

means for introducing liquid smoke onto said surface;

means for spreading the liquid smoke on said surface; and

means for heating said member to regenerate the liquid smoke into vapor.

4,637,306

BUCKETS FOR COMPACTABLE PRODUCTS

Jean-Paul Bricaud, 95 Rue du Stade-La Chabossière, 44220 Coueron, and Martine Bricaud, 6 Rue Yves-Marie, 44000 Nantes, both of France

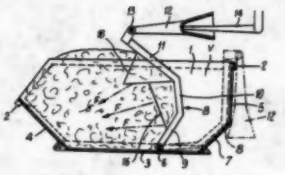
Filed May 16, 1985, Ser. No. 734,591

Claims priority, application France, May 23, 1984, 84 08055; Jan. 24, 1985, 85 00974

Int. Cl.[4] B30B *7/00*

U.S. Cl. 100—233 **4 Claims**

1. A bucket for compactable products, having a flat horizontal bottom and opposite upstanding side walls, a compaction member pivotally mounted on said bottom for vertical swinging movement about a horizontal axis disposed intermediate said side walls, said compaction member having a shape comprising a first portion that lies against the bottom of the bucket and a second portion that lies against one of said walls in a lowered position of the bucket, and means to move the com-



paction member from said lowered position to a raised position in which the compaction member compacts material in the bucket against a said side wall which is opposite said one side wall.

4,637,307

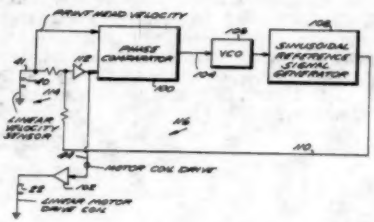
AUTOMATIC MECHANICAL RESONANT FREQUENCY DETECTOR AND DRIVER FOR SHUTTLE PRINTER MECHANISM

Donald E. Miller, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Sep. 13, 1983, Ser. No. 531,648

Int. Cl.[4] B41J *3/02*

U.S. Cl. 101—93.04 **25 Claims**



1. A shuttle printer comprising:

an electrically driven shuttle print mechanism having a varying instantaneous mechanical resonant frequency for its shuttling movement;

control means coupled to said mechanism for deriving a reference signal representative of the instantaneous value of said mechanical resonant frequency including motion sensor means for detecting the instantaneous motion of said mechanism; and

electrical motor driving circuit means responsive to said reference signal and to said detected instantaneous motion for driving said mechanism in synchromesh with its derived instantaneous mechanical resonant frequency while also conforming to a predetermined motion pattern.

4,637,308

SCREEN PRINTING APPARATUS USING PARTIALLY SATURATED SOLVENT INKING ATMOSPHERE

Werner Vidoni, Stoesselstrasse 25, 8720 Schweinfurt, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,104

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446254

Int. Cl.[4] B41F *15/00*

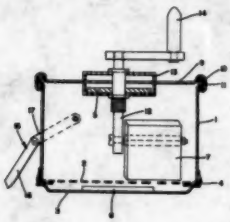
U.S. Cl. 101—114 **25 Claims**

1. A screen printing apparatus comprising:

a substantially closed box, open on one side;

a screen attached to and disposed across said open side of said substantially closed box;

a cover detachably joined to said box and adapted for closing said open side of said box;



a movable doctor blade located in the interior of said box; and

means for generating a partially saturated solvent atmosphere within said box.

4,637,309

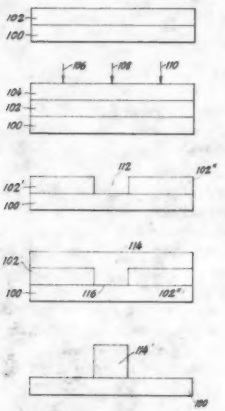
METHOD OF STENCILING USING REMOVABLE PROTECTIVE COAT BEFORE APPLYING STENCIL

Terrance Cafferty, 52 Talmadge Dr., Huntington, N.Y. 11746

Continuation-in-part of Ser. No. 589,024, Mar. 13, 1985, Pat. No. 4,563,948. This application Aug. 16, 1985, Ser. No. 766,191

Int. Cl.[4] B24C *1/04*; B24B *1/00*; B30B *13/00*

U.S. Cl. 101—129 **9 Claims**



5. A stencilling method employing a stencil with openings therein shaped to form characters, said method comprising covering a part to be stencilled with a removable substance, placing said stencil over the removable substance, eroding the removable substance through the stencil, removing the stencil, applying a marking substance over the remaining removable substance and over the area where the removble substance has been eroded, and then removing the removable substance and the marking substance over the same to leave marking substance only on the area where the removable substance was eroded to form said characters.

4,637,310

MESH ROLLER FOR PRINTING PRESS AND METHOD OF FABRICATION

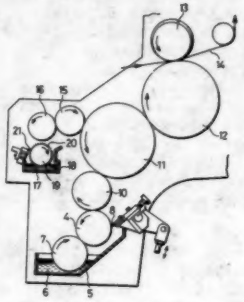
Masayoshi Sato, Kawasaki, and Noritake Harada, Yokohama, both of Japan, assignors to Tokyo Kikai Seisakusho Ltd., Tokyo, Japan

Continuation of Ser. No. 530,026, Sep. 7, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 722,994

Claims priority, application Japan, May 9, 1983, 58-80579

Int. Cl.[4] B41F *31/26*

U.S. Cl. 101—426 **2 Claims**



1. A process for fabricating a mesh roller for a printing press, wherein the roller includes a large number of recesses formed in the operative external surface thereof, with the internal surfaces of the recesses being defined by a layer of hydrophobic material having an affinity for ink, and the external surface areas of the roller surrounding said recesses being defined by a wear resistant layer, said process comprising the steps of: providing a metal mesh roller member formed from a base nitridable material and having said recesses formed in the outer peripheral surface thereof; nitriding the operative external surface of the roller member to provide the external surface of the roller member with a hardened layer without reducing appreciably the volume of the recesses; providing a coating of hydrophobic material over the entire outer peripheral surface of the roller including the internal surfaces of the recesses formed therein: and removing the hydrophobic material from the external surface areas surrounding the recesses and thus exposing the hardened layer of the base nitridable material of the roller member at said external surface areas, with said hardened layer providing a layer of wear resistant material, with only the internal surfaces of the recesses being coated with said hydrophobic material.

4,637,311

METHOD OF, AND APPARATUS FOR, INCREASING THE ENERGY IN AN ELECTROMAGNETIC FUZE SYSTEM

Robert Rehmann, Neerach, Switzerland, assignor to EMS-Inventa AG, Zurich, Switzerland

Filed Feb. 11, 1985, Ser. No. 700,612

Claims priority, application Switzerland, Feb. 24, 1984, 919/84

Int. Cl.[4] F42C *11/02*

U.S. Cl. 102—209 **16 Claims**

1. A method of generating increased energy in an electromagnetic fuze system of a low-acceleration projectile, said electromagnetic fuze system containing a detonator generator operatively connectable to a fuze element and provided with a reaction member which is displaceable from a rest position with respect to an associated stator under the action of a firing acceleration, the electrical energy produced thereby being storable in a capacitor and being provided thereby for detonat-

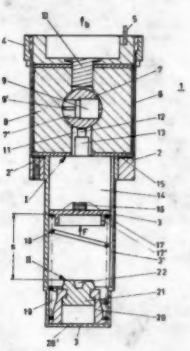
ing an electric primer capsule located in said fuze element, said method comprising the steps of:

arranging the detonator generator in a first position in a housing of the electromagnetic fuze system;

arranging an impact body in a rear portion of said housing in spaced relationship and opposite to said detonator generator when in said first position;

holding said detonator generator in said first position thereof in a bore of said housing by means of an elastic force acting upon a front side of said detonator generator at the moment of firing said projectile;

after the onset of the firing acceleration, displacing said



detonator generator from said first position thereof and coaxially relative to said housing into a second position due to inertial forces acting upon said detonator generator;

impacting said detonator generator in the second position thereof against said impact body provided with a central bore and thereby accelerating said reaction member in order to generate electrical energy;

thereafter returning said detonator generator from said second position into said first position thereof by means of said elastic force; and

transmitting said electrical energy, after said detonator generator has arrived at its first position, to the fuze element.

4,637,312

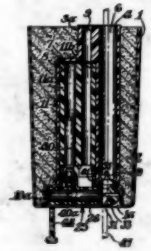
EXPLOSIVE PRIMER AND CARRIER THEREFOR

Philip E. Adams; Michael J. McGowan, both of Martinsburg, W. Va., and Malak E. Yunan, Boonton Township, Morris County, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1985, Ser. No. 729,480

Int. Cl.[4] F42B *3/10*; C06C *5/04*

U.S. Cl. 102—275.12 **14 Claims**



1. A carrier for supporting a primer explosive charge in operative relationship to an initiating means therefor, said carrier comprising a cup having

(a) an open top end and a closed bottom end, said bottom end being provided with a recessed portion;

(b) first and second tubular members projecting into said cup from said recessed portion on axes substantially parallel to said cup's longitudinal axis, (1) the first of said tubular members having an open top end located in the vicinity of said cup's open top end and an open bore which extends from said first tubular member's top end and terminates at the bottom end of said cup in said recessed portion so as to form an opening therein and a first threading tunnel in said cup, and (2) the second of said tubular members having (A) a closed end located inside said cup and a bore which extends from said closed end and terminates at the bottom end of said cup in said recessed portion so as to form an opening therein and a detonator-positioning cavity in said cup, or (B) an open top end located in the vicinity of said cup's open top end and an open bore which extends from said second tubular member's top end and terminates at the bottom end of said cup in said recessed portion so as to form an opening therein and a second threading tunnel or a detonator-positioning cavity in said cup; and

(c) means in said recessed portion for engaging an explosive-containing plastic connecting block.

4,637,313

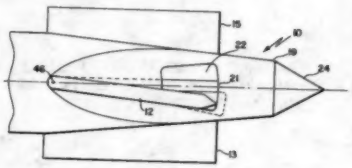
EARTH PENETRATOR

David Henderson, Carlisle; James A. Hollowell, Groton, both of Mass., and Howard A. Woodbury, Plaistow, N.H., assignors to Avco Corporation, Wilmington, Mass.

Continuation of Ser. No. 226,663, Jan. 5, 1981, abandoned. This application Dec. 31, 1984, Ser. No. 702,410

Int. Cl.[4] F42B *25/20*

U.S. Cl. 102—398 **7 Claims**



1. A penetrator comprising:

(a) a tubular body;

(b) symmetric fins extending radially from the axial center of rotation of said body;

(c) said fins being adapted in response to non-axially inertial forces to rotate in a plane about a pivot axis which intersects the center of rotation of roll axis of said body whereby upon impact of said body with an object, any fins subjected to non-axially inertial forces will rotate in a direction opposite to such forces.

4,637,314

RAILROAD SPIKE RESINSTALLATION APPARATUS

David I. Gower, P.O. Box 6266, Reno, Nev. 89513

Filed Jun. 20, 1985, Ser. No. 746,755

Int. Cl.[4] E01B *29/26*

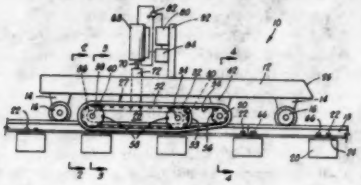
U.S. Cl. 104—17.1 **25 Claims**

1. An apparatus for reinstalling without impacting loosened spikes spaced along a railroad rail for clamping said rail in a position adjacent a road bed, said apparatus comprising:

a wheel-mounted chassis adapted for rolling on said rail; and

a crawler connected to said chassis and adapted for rolling adjacent a lower portion of said rail when in an operating position, said crawler rollingly contacting said loosened

spikes such that weight is applied to said spikes directly by said crawler for downwardly forcing said spikes back to

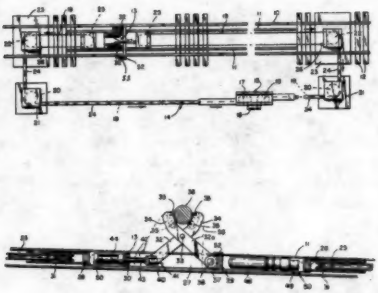


an installed position as said crawler continuously rolls along said road bed.

substantially at the transverse center of the carriage, the carriage having opposite side horizontal guideways, a transverse horizontal slide having end portions engaged with said guideways and being horizontally movable therealong relative to the carriage and being connected with said piston rod, two cooperating pairs of rail car axle-engaging arms one of said pair of rail engaging arms being pivotally attached to said carriage and the other of said pair of rail engaging arms being pivotally attached at their lower ends to said slide, the arms of each pair crossing and being pivotally connected intermediate their ends, whereby the arms are raised and lowered in unison by the operation of said power cylinder, a self-contained fluid pressurizing system for said power cylinder on said carriage near one end of the carriage, said power cylinder being located near the other end of the carriage and said rail car axle-engaging arms being located near the longitudinal center of the carriage and between the power cylinder and said pressurizing system, a horizontal cross arm on said carriage near said rail car axle-engaging arms and extending laterally outwardly from one side of said carriage and one of said rails, a pivoted member on said cross arm and being swingable thereon in a vertical plane and being located laterally outwardly of said one rail and near and inwardly of one existing rail car track, a rail car wheel flange contact element on said pivoted member, and an electrical limit switch on said cross arm and being operatively connected with said pivoted member.

4,637,315
Patent Not Issued For This Number

4,637,316
RAIL CAR POSITIONING SYSTEM
Curtis E. Carroll, 9957 Tracy Rd., Atoka, Tenn. 38004
Filed Apr. 25, 1985, Ser. No. 727,124
Int. Cl.[4] B61J *3/04*
U.S. Cl. 104—176 **4 Claims**



2. A rail car movement and positioning apparatus comprising a pair of spaced parallel rails adapted to be mounted on crossties between existing rail car tracks, a low profile carriage guidingly mounted on said rails and lying substantially in a common horizontal plane with said rails, a cable propulsion system for moving said carriage in opposite directions on said rails and having connections with opposite ends of said carriage, a single horizontal axis power cylinder on said carriage and having a piston rod extending longitudinally of said rails

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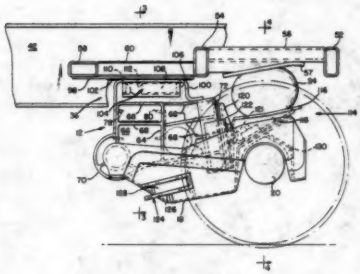
4,637,317
Patent Not Issued For This Number

4,637,318
SWIVELABLE SINGLE AXLE RAILCAR TRUCK AND RAILCAR
H. Neil Paton, 2521 W. Montlake Pl. East, Seattle, Wash. 98112
Filed Feb. 8, 1985, Ser. No. 699,739
Int. Cl.[4] B61F *5/38*
U.S. Cl. 105—167 **27 Claims**



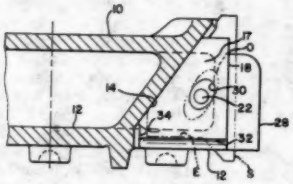
23. A swivelable single axle railcar track which is self-steering in response to wheel creep forces, comprising: damper ramp support means; suspension means mounted by said damper ramp support means supporting a single wheeled axle out from under said damper ramp support means beneath an overhead railcar body, and operative to provide vertical load bearing support for said railcar body adjacent both ends of said axle; and swivel means operatively associated with said damper ramp support means providing horizontal load bearing support for said body about a rotational truck axis outward from said damper ramp support means.

4,637,319

BOLSTER FRICTION SHOE POCKET

Charles Moehling, Arlington Heights, and James A. Henkel, Park Forest, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Dec. 3, 1984, Ser. No. 677,390
Int. Cl.[4] B61F 5/40
U.S. Cl. 105—207 2 Claims



1. A railway truck friction shoe pocket for accommodating a friction shoe therein, said friction shoe pocket comprising a sloping wedge wall providing a wedge seat for the friction shoe, a first lateral wall depending from said wedge wall, a second lateral wall spaced from said first lateral wall and depending from said wedge wall, each of said lateral walls having planar inner faces adapted to engage planar faces on the friction shoe, the friction shoe having an opening on either sidewall thereof, at least one of said planar inner faces on said lateral walls being provided with a recess, said recess including a pinhole and said recess is positioned to allow an edge of said opening in the friction shoe sidewall to slidingly engage the planar inner face of the lateral wall projecting beyond said relieved section thereby preventing the formation of protuberances projecting perpendicularly from the lateral walls of the friction shoe pocket due to wearing away of areas surrounding the pinhole on the planar faces.

4,637,320

ARTICULATED GONDOLA RAILCAR

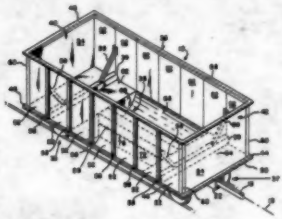
H. Neil Paton, 2521 W. Montlake Pl. E., and John B. Skilling, 539 McGilvra Blvd. E., both of Seattle, Wash. 98112

Continuation-in-part of Ser. No. 382,728, May 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 238,413, Feb. 26, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 547,967
Int. Cl.[4] B61D 3/00, 7/00
U.S. Cl. 105—406.1 21 Claims

1. A gondola railcar, comprising:

a carbody supported by two spaced apart trucks; and two coupler means respectively located adjacent the ends of said carbody;

wherein said carbody includes: a depressed center section located between said trucks; through sill means extending between said coupler means for transmitting essentially all buff and draft forces between said coupler means along a rectilinear load path aligned with said coupler means; two side wall means respectively positioned on opposite sides of said through sill means and operatively connected to said center section for laterally containing the lading of said carbody and for receiving essentially all vertical loads applied to said center section, said center section extending below said side wall means; and two bolster means extending transversely to and overlying said through sill means for supporting said side wall means, and for receiving vertical load bearing support at four vertical load support points, two of which are spaced apart on opposite sides of said through sill means adjacent one end of said carbody and the other two of which are spaced apart on opposite sides of said through sill means adjacent the other end of said carbody.

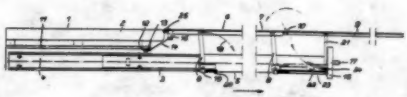


4,637,321

RETRACTABLE IRONING BOARD CONSTRUCTION

Georg Hasler, and Rudiger Walz, both of Nagold, Fed. Rep. of Germany, assignors to Hafele KG, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 693,010
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430491
Int. Cl.[4] A47B 1/04
U.S. Cl. 108—72 11 Claims

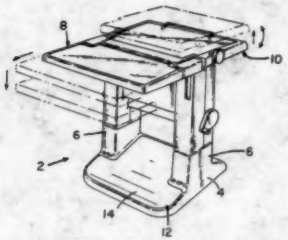


1. A retractible ironing board construction for use with a countertop extending at a horizontal level, comprising a longitudinally extending guide extending substantially parallel to the horizontal level and adapted to be positioned below the countertop, a draw member telescopically engaged with said guide for movement in a pull-out direction substantially parallel to the horizontal level, a plurality of parallel pivotal guide arms pivotally connected at spaced locations on said draw member, an ironing board pivotally connected to said guide arms and being movable between a collapsed position below the countertop and an extended position at the horizontal level when said draw is moved along said guide in said pull-out direction, said ironing board being substantially flush with and alongside the countertop in its extended position, anchor means mounted adjacent said guide, and a flexible member connected between said anchor means and said ironing board and being of a length to hold an end of said ironing board against an end of the countertop in said extended position of said ironing board, the length of said flexible member being selected so that with said ironing board in said extended position said flexible member is pulled taut between said ironing board and said anchor means.

4,637,322
ADJUSTABLE COMPUTER WORK TABLE

James F. Hampshire, Stephens City, Va.; Hugh F. Groth, Richfield, and John M. Collins, Sagamore Hills, all of Ohio, assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Feb. 20, 1985, Ser. No. 703,582
Int. Cl.[4] A47B *11/00*
U.S. Cl. 108—102 25 Claims

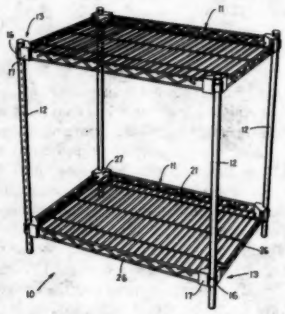


1. An adjustable work table comprising: a frame having spaced-apart vertical sides; a horizontal through-shaft having a longitudinal axis extending between said frame sides; each said frame side including support means for supporting opposite ends of said shaft; a table surface assembly rotatively mounted to said shaft between said frame sides; camming angular adjustment means for rotating said table surface assembly into selective angular positions about said shaft; said angular adjustment means comprising rotary control means having an axis of rotation coincident with said shaft axis.

4,637,323
CORNER STRUCTURE FOR ADJUSTABLE SHELVING (WITH OPPOSED CLAMPING MEMBERS)

Charles W. Nicely, Dallas Township, Luzerne County, Pa., assignor to United Steel & Wire Company, Battle Creek, Mich.

Filed Jun. 29, 1984, Ser. No. 625,943
Int. Cl.[4] A47B *9/08*
U.S. Cl. 108—107 12 Claims



8. A shelving unit having a plurality of upright posts, a plurality of vertically spaced shelves, and a plurality of corner structures coacting between each said shelf and a respective said post for stationarily securing said shelf relative to said post at a selected vertical location, comprising the improvement wherein:

said corner structure includes a first elongated looplike clamping member positioned in surrounding relationship to a respective said post, said looplike member resembling a strap and being formed as an integral one-piece member from a thin platelike metal, said looplike member defining therein an opening which is elongated in a direction transverse with respect to the longitudinal direction of said post;

said looplike clamping member having a channellike clamping part formed at one end thereof and a channellike wedging part formed at the other end thereof and disposed in opposed relationship to said clamping part, said post being positionable within said clamping part so as to be engaged thereby, said wedging part projecting outwardly from said post on the side thereof opposite from said clamping part so as to define a wedge-receiving space between said wedging part and said post, said wedging part of said first clamping member including a rear wall which is spaced from the post and extends at a slight angle relative to the longitudinal direction of the post, said wedging part also including a pair of spaced side plates which joint to opposite sides of said rear wall and project forwardly therefrom so as to sidewardly embrace opposite sides of said post, said side plates being joined to said channel-shaped clamping part so as to surround said post;

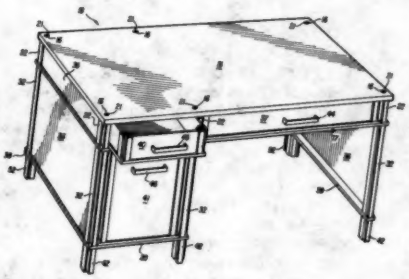
said corner structure including a second clamping member which is stationarily secured to one corner of said shelf and is stationarily engageable with said first clamping member for effecting clamping engagement of said post directly between said first and second clamping members, said second clamping member integrally formed in one piece of a plastics material;

said second clamping member including a body part which is stationarily secured to said shelf and projects-outwardly so as vertically overlie said wedging part of said first clamping member, said second clamping member having a blocklike clamping wedge which is fixed to and projects downwardly in cantilevered fashion from said body part for snug disposition within said wedge-receiving space, said clamping wedge having a front clamping surface which directly clampingly engages the periphery of said post on the side thereof opposite from said clamping part, said clamping wedge also having a rearwardly directed wedge surface which directly wedgingly engages the rear wall of the wedging part of said first clamping member.

4,637,324
FURNITURE ASSEMBLY AND ASSEMBLY DEVICE

Richard W. Janson, Box 6090, Canton, Ohio 44706

Filed Aug. 27, 1981, Ser. No. 296,789
Int. Cl.[4] A47B *3/06, 13/02*
U.S. Cl. 108—111 6 Claims



1. A spacer for supporting a horizontal platform which comprises an upright member having a uniform cross-section throughout its length, said member defining a groove for receiving a vertical panel and an opening spaced from said groove, said opening adapted to receive a vertical post for connecting a plurality of like spacers with horizontal platforms having aligned openings receiving said vertical post, said

groove defined by two planar parallel longer sides and a shorter interior end so that as seen in cross-section each side is longer than their distance apart, planes coinciding with said sides being parallel to and spaced outwardly of said opening so that they are spaced outboard of and parallel to planes tangent to said opening, and a plane generally coinciding with said interior end throughout its length projecting through about the centerline of said opening, said member defining a further like groove which is adapted to receive a further vertical panel disposed at right angles to said first mentioned vertical panel on the other side of said opening, said grooves as seen in cross-section each having uniform depths defined by said interior ends, lines connecting said interior ends of said grooves to each other and to the centerline of said opening forming substantially a right triangle with the two shorter sides of said right triangle being equal in length, said member having a plane of symmetry which contains said centerline, the outer sides of said member which define in part its periphery coinciding in part, as seen in cross-section, with the sides of a square and said plane of symmetry coinciding with the diagonal of said square, said opening being circular as seen in cross-section.

4,637,325

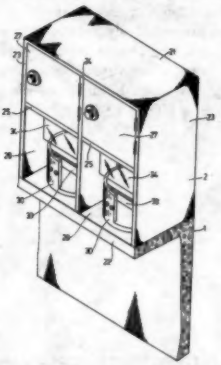
SECURITY CASE USED ON COUNTER

Chung-Yieh Hong, No. 9, Lane 493, Yen Pin I Road, Ku San Li, Chi San Cheng, Kao Hsiung Hsien, Taiwan

Filed Aug. 7, 1985, Ser. No. 763,545

Int. Cl.[4] E06B *7/32*; E05G *1/00*; E04B *1/346*

U.S. Cl. 109—19 **3 Claims**



1. A security case used on a counter comprising:

a housing having a top panel, a bottom panel, two vertical side panels interconnecting said top and bottom panels, at least one shelf disposed between said top and bottom panels, at least one front panel connected to said top panel, said side panels and said shelf for covering the front side of the upper portion of said housing above said shelf, and at least one door means for covering the compartment confined by said top panel, said side panels, said shelf and said front panel disposed at the rear side of said housing, wherein said shelf, said bottom panel and said side panels define a front opening at the front side of said housing and a rear opening in alignment with said front opening at the rear side of said housing;

at least one container mounted in said housing for rotation about a vertical axis between said front and rear openings, said container having at least one access opening; and

a transparent cover means disposed in said housing for covering at least one portion of said front opening or said rear opening.

4,637,326

MONEY BOX ARRANGEMENT

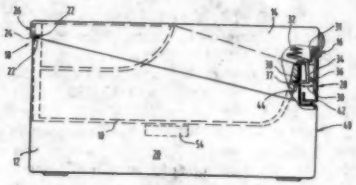
Guenter Baitz, and Wilfried Dobring, both of Berlin, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,418

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411686

Int. Cl.[4] E05G *1/00*

U.S. Cl. 109—49 **5 Claims**



1. A cashbox assembly comprising:

a strongbox comprising the integral combination of a bottom, a rear wall, opposite side walls and a front wall;

a cash drawer insert comprising the integral combination of a bottom, a rear wall, opposite side walls and a front wall, the cash drawer insert overall being of lesser dimension than said strongbox to fit within said strongbox;

means disposed on the interior surfaces of the strongbox side walls to receive said insert and hold said insert within the upper interior volume of said strongbox with the rear wall of said insert abuttingly adjacent the interior surface of the strongbox rear wall and with the front wall of the insert adjacent the interior side of the front wall of the strongbox;

cover means for optionally covering the insert, the strongbox, and the combination of the insert and the strongbox, said cover comprising the integral combination of a top, a rear wall and a front wall;

openings formed respectively in the front and rear walls of the strongbox;

connector means on the rear wall of the cover projecting through the opening in the rear wall of the strongbox and into interfering relationship with the rear wall of the insert to secure said cover to the strongbox and to the insert within said strongbox; and

latch means mounted on the front wall of the cover including a latch bar which, in a latched position, extends through the opening of the front wall of the strongbox into interfering relationship with the front wall of the insert to inhibit relative movement between the cover of the strongbox and the insert.

4,637,327

STOKING PLANT FOR FUEL IN WHOLE BALES

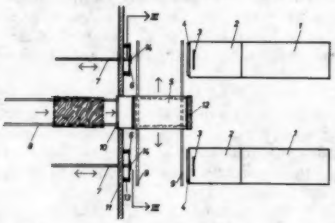
Michael L. S. Jorgensen, Aarhus, Denmark, assignor to Jydsk Varmekedelfabrik A/S, Braband, Denmark

Filed Jan. 22, 1986, Ser. No. 821,244

Int. Cl.[4] F23K *3/12*

U.S. Cl. 110—289 **6 Claims**

1. Stoking plant for fuel in whole bales, where the bales are conveyed on a transport track from a store and stoked in the whole condition into one of a number of combustion furnaces, characterized in that means are provided for the transfer of bales through a closable opening to a bale transport carriage which is on rails and formed as a tubular sluice open at both ends and arranged for the transport of one bale at a time, and which conveys the fuel forward to the furnace which is in need of fuel, and when the bale transport carriage has reached a predetermined position at the stoking door of the furnace, the transport carriage is closed with a cover door, whereby a switch element is activated, the stoking door is opened and the fuel is stoked, after which the stoking door is closed, the cover door is withdrawn and the bale transport carriage returns to the closable opening to be refilled.



4,637,328

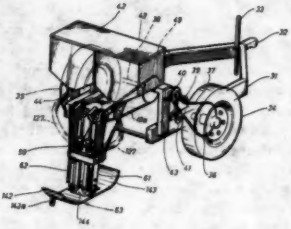
NO-TILL PLANTER

Arnold. J. Topham, Booneville, and Harry W. Wilson, Paris, both of Ark., assignors to Dibbler, Inc., Booneville, Ark.

Filed Jul. 25, 1984, Ser. No. 634,278

Int. Cl.[4] A01C *5/00*

U.S. Cl. 111—89 **27 Claims**



1. An apparatus for repeatedly and successively penetrating the soil, to a predetermined depth at a predetermined spacing, and depositing a quantity of material comprising:

(a) means for storing material and transporting the material to a metering device;

(b) a metering device which meters and measures the material to be deposited;

(c) a vertically disposed, pivotally mounted piercing device to pierce the soil with an opening to permit depositing said metered material in the soil, said piercing device operating in a manner to minimize plugging of the opening as the soil is pierced, said metering device operatively coupled to said piercing device;

(d) a drive train to simultaneously operate the piercing device and metering device;

(e) means for horizontally transporting storing means, metering device, piercing device, and drive train; and

(f) means for coupling the metering device, piercing device and transporting means wherein the drive train and transportation means operate cooperatively thereby mechanizing the metering device and piercing device;

(g) a sled assembly, wherein the piercing device and metering device are pivotably mounted to said sled assembly thereby permitting the metering device and piercing device to operate in the vertical plane, while the transporting means moves in the horizontal plane, thereby achieving a leap frog effect.

4,637,329

TUFTING MACHINE WITH MODULAR CONSTRUCTED NEEDLE BARS

Paul A. Czelusniak, Jr., Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

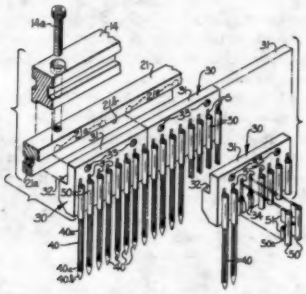
Continuation-in-part of Ser. No. 678,072, Dec. 4, 1984, Pat. No. 4,574,716. This application Jan. 21, 1986, Ser. No. 821,036

Int. Cl.[4] D05C *15/00*

U.S. Cl. 112—80.45 **10 Claims**

1. A needle bar of modular construction for use in a tufting machine and comprising an elongate bar and a plurality of

aligned modular needle bar units of tufting needles carried by said bar, each of said modular units comprising an elongate mounting bracket having a face, a plurality of uniformly spaced apart parallel arranged relatively short separate tubes for receiving tufting needles positioned on said mounting bracket transversely thereof and extending along the face of the bracket, means for securing said tubes to said mounting bracket, a plurality of tufting needles each having a shank and an opposing tapered end having a transverse yarn receiving eye therein, the shank of said needles being positioned within



said tubes, fastener means carried by said mounting bracket for securing the tufting needles in a predetermined position within the tubes with eyes of the tufting needles in alignment with each other, and means cooperating with said mounting brackets of said modular units for mounting the modular units on said elongate bar with the eyes of the tufting needles of all of the modular units in alignment with each other and with all the needles in uniformly spaced apart parallel relation to each other.

4,637,330

REINFORCED SEAM CONSTRUCTION

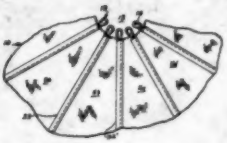
Daniel C. Shewmon, 1940 Byram Rd., Clearwater, Fla. 33515

Continuation of Ser. No. 630,802, Jul. 13, 1984, abandoned. This application Jul. 1, 1986, Ser. No. 881,489

Int. Cl.[4] D05B *93/00*; B63B *21/48*

U.S. Cl. 112—417 **5 Claims**

1. A seam for joining a plurality of separate fabric members into a composite structure comprising at least first and second fabric panels having first and second spaced edges, said first edge of said first fabric panel being folded so as to create a first folded edge portion having upper and lower fabric layers, cord means having at least an elongated portion disposed within the extending along said first folded edge portion of said first fabric panel, a first line of stitching extending through said upper and lower fabric layers of said first panel and said elongated portion of said cord means thereby joining said upper and lower fabric layers on generally opposite sides of said cord means, said second edge of said second panel being folded to create a second folded edge portion having upper and lower fabric layers, said first folded edge portion of said first fabric panel and said elongated portion of said cord means and said first line of stitching being disposed between said upper and lower fabric layers of said second folded edge portion of said second fabric panel, another line of stitching passing through and joining said first and second folded edge portions of said first and second fabric panels and said elongated portion of said cord means, said first and second fabric panels being joined



with one another and said elongated portion of said cord means so that said second edge of said first fabric panel is extendable outwardly on a generally opposite side of said elongated portion of said cord means from said first edge of said second fabric panel.

4,637,331

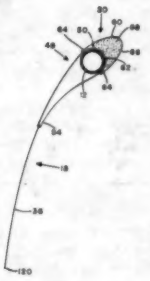
SAIL AND SAILING RIG

Gregg B. Jackson, 721 Upshur St., NW., Washington, D.C. 20011

Filed Nov. 28, 1984, Ser. No. 675,610

Int. Cl.[4] B63H *9/08*

U.S. Cl. 114—39 **22 Claims**



1. A sail for mounting on a mast of a wind-driven vessel, said sail comprising:

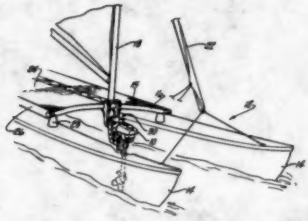
(a) a sail body having a head, tack, luff, and trailing edge, and including a mast-enveloping portion being generally located at the luff of said sail body, said mast-enveloping portion being adapted to at least partially surround and substantially rotate about the mast, and having a leading surface disposed and facing forwardly of the mast; and

(b) a semirigid forward fairing connected to said leading surface of said mast-enveloping portion of said sail body so as to be disposed forwardly of the mast and define, with said mast-enveloping portion, an airfoil rotatable about the mast.

4,637,332
PIVOTAL MOTOR MOUNT

Fred W. Glime, 30640 Balewood, Southfield, Mich. 48076

Continuation of Ser. No. 381,522, May 24, 1982, abandoned. This application Aug. 27, 1985, Ser. No. 769,828
Int. Cl.[4] B63H *21/26*
U.S. Cl. 114—61 5 Claims



1. A motor supported for supporting a motor on a twin-hull sailboat, said boat having a center line with first and second spaced apart parallel hulls extending along said center line, said hulls being supported by first and second spaced apart parallel cross-bars positioned perpendicular to said center line, said first cross-bar being positioned approximate the bow of said boat and said second cross-bar being positioned approximate the stern of said boat, said motor support comprising:

an upper member and a lower member pivotally connected at adjacent ends by a coupling means;

said coupling means including a first pivot plate mounted to said upper member and a second pivot plate mounted to said lower member, said plates being coupled to permit pivotal movement of said lower member with respect to said upper member;

said upper member including a bracket means opposite said pivot plate, said bracket means having a shape complimentary to and adapted for rigid attachment to one of said first and second cross-bars;

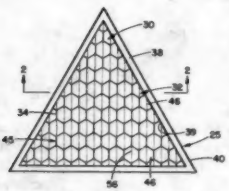
said lower member including spaced apart substantially parallel arms interconnected by said second pivot plate and extending substantially downwardly therefrom with said opposite end of said lower member being adapted to support said motor means;

said lower member being pivotable with respect to said upper member about an axis substantially parallel to said center line between a first position wherein said second member is substantially parallel to said cross-bar, whereby said motor is in a non-use, stand-by position and a second position, wherein said second member is substantially perpendicular to said cross-bar, whereby said motor is in a use position and operable to propel said boat.

4,637,333
SAIL HAVING A HONEYCOMB ARRAY OF POCKETS

Howard N. Christ, 291 Cedar Ave., Islip, N.Y. 11751

Filed Dec. 9, 1985, Ser. No. 806,560
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—103 13 Claims



1. A sail for driving a wind driven craft, comprising:

a panel having a multiplicity of pockets disposed in a honeycomb array;

said pockets having open ends at one side of said panel, inner concave closed ends, and external convexities at the opposite side of said panel;

said open end of each of said pockets having edges contiguous with edges of open ends of other of said pockets;

each of said pockets having a central axis disposed perpendicularly to said open side of said panel;

each of said pockets having an infinite number of diametral planes including said central axis oriented perpendicular to said oen side of said panel and bisecting said pockets to define two spaces of equal volume; so that the wind drives said craft with maximum efficiency and minimum destabilzing effects when impinging in shifting directions on said one side of said panel; and

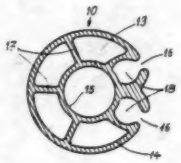
flange means at peripheral edges of said honeycomb array overlaying said pockets at said peripheral edges to restrict flow of air between opposite side of said panel; and

wherein said pockets are disposed in parallel rows, with pockets in adjacent rows offset from each other, and with pockets in alternate rows disposed in alignment perpendicular to said rows, so that said pockets define said honeycomb array in said panel.

4,637,334
ROLLER FURLING ELEMENT FOR BOATS EQUIPPED WITH SAILS

Daniel Montandon, Yverdon-Les-Bains, Switzerland, assignor to Nirvana Espar Systems, S.A., Yverdon-Les-Bains, Switzerland

Filed Jul. 17, 1985, Ser. No. 755,751
Claims priority, application Switzerland, Jul. 27, 1984, 03638/84
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—106 6 Claims



1. A roller furling element for boats equipped with sails comprising a single piece profiled member extruded from a light metal or alloy and including:

two concentric cylindrical tubes defined by peripheral walls of substantially uniform thickness and having substantially the same uniform wall thickness, the peripheral wall of the internal tube being continuous and alone defining a cylindrical chamber adapted to accommodate a stay for rotation of said profiled member around said stay, and the peripheral wall of the external tube having a longitudinal slot allowing passage of a sail therethrough, the bolt rope of which may be held between the two tubes; and,

longitudinal walls distributed within the annular space between the tubes and uniting the tubes to one another, said longitudinal walls being integrally connected to said peripheral walls by said extrusion to provide a single extruded piece having a cellular construction for resisting bending as well as torsion, a plurality of said longitudinal walls having substantially the same thickness as said tubes, and two of said longitudinal walls being proximate the edges of said slot and having concave profiles so as to form a lodging of roughly circular cross-section for receiving and retaining the bolt rope of the sail.

4,637,335

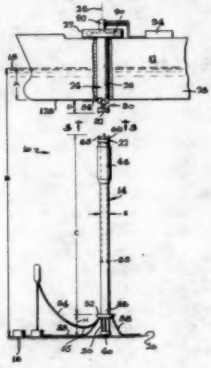
OFFSHORE HYDROCARBON PRODUCTION SYSTEM

Jack Pollack, Reseda, Calif., assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 438,322, Nov. 1, 1982. This application Apr. 24, 1984, Ser. No. 603,434

Int. Cl.[4] B63B *21/52*

U.S. Cl. 114—230 7 Claims



3. An offshore system comprising:

a vessel;

a universal joint hanging from said vessel and having means for connecting to the top of a column, to permit the column to pivot about a pair of horizontal axes relative to the vessel;

a pair of line guides which closely surround lines extending therethrough, lying on opposite sides of the lower end of said joint;

a winch means on said vessel for pulling up lines;

a column having a lower end anchored by a plurality of chains extending in loose catenary curves to the sea floor, and having an upper end; and

a pair of lines extending from said winch means and through said line guides to the upper end of said column, whereby to urge said joint into alignment with the top of the column as the column is being pulled up.

4,637,336

PERMANENT ANCHORING ARRANGEMENT FOR FLOATING STRUCTURES

Jürgen Engelskirchen, Hamburg, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,569

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 33441170

Int. Cl.[4] B63B *21/50*

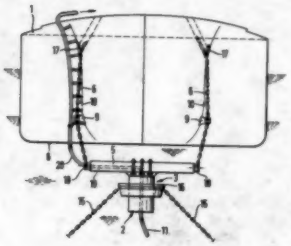
U.S. Cl. 114—293 15 Claims

1. An underwater anchoring arrangement for floating structures, such as a tanker in high seas, of the type using a plurality of anchoring ropes and mooring hawsers, the tanker having a hull, the anchoring arrangement comprising:

a spreader beam suspended in a substantially horizontal manner under the tanker and supported by a plurality of mooring hawsers which are guided on the hull of the tanker;

a support column structure rigidly suspended from and supported by said spreader beam, said support column structure having a structural portion with a substantially vertical axis, said support column structure including a diver's chamber, said diver's chamber housing a bearing means enabling relative rotary motion of said diver's chamber about said vertical axis with respect to said structural portion of said support column structure, said bearing means providing support for said structural portion in a direction along said vertical axis and a direction radial thereof; and

a plurality of anchor chains connected to and holding down



said diver's chamber so as to anchor the tanker through the support column structure, whereby the tanker together with the spreader beam is capable of rotary oscillatory movement about said vertical axis with respect to the anchored diver's chamber.

4,637,337

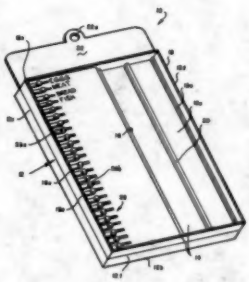
SHOPPING GUIDE DEVICE AND THE LIKE

Alan A. Murray, 120 S. Swall Dr., Apt. 103, Los Angeles, Calif. 90048

Filed Nov. 30, 1984, Ser. No. 677,087

Int. Cl.[4] G09F *7/10*

U.S. Cl. 116—323 3 Claims



1. A pre-printed shopping guide device, comprising:

(a) a two-faced rectangular lengthwise elongated table, having shorter top and bottom sides, each face of said table being surrounded by a projecting rim terminating along its elongated sides in an inwardly extending ledge forming a compartment therewith, and a centrally and longitudinally extending first rib dividing said table faces, respectively into two equally sized compartments, respectively provided with a longitudinally centrally disposed second rib said ledge, first and second ribs extending parallel with one another at substantially equal heights.

(b) Four rectangular lengthwise elongated plates, on which, respectively a columnar list of purchasable items are imprinted, being so dimensioned as to be mountable, respectively within said compartments and resting, when so mounted, on said ledge and ribs, each of said plates having along one of its elongated sides a multiplicity of open-ended slits columnarly arranged, respectively vis-a-vis one of said imprinted items on said plates.

(c) A multiplicity of T-shaped tabs, being of shorter length than said slits for insertion respetively, slidably there-

within, any of said tabs capable of being slided towards or away from any of said imprinted items to be

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4,637,338

SCRAPING APPARATUS

Albert Wöhrle, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

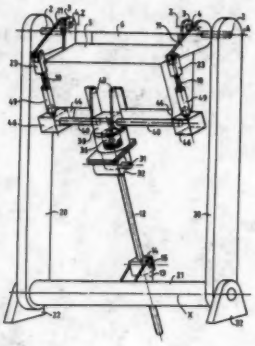
PCT No. PCT/EP84/00088, § 371 Date Oct. 5, 1984, § 102(e) Date Oct. 5, 1984, PCT Pub. No. WO84/03847, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 29, 1984, Ser. No. 668,374

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3311999

Int. Cl.[4] B05C *11/04*

U.S. Cl. 118—126 12 Claims



1. An apparatus for scraping off excess composition coating applied to a travelling web, the apparatus comprising:

a doctor support member and a doctor supported thereon, the doctor having a blade edge disposed transversely to the direction of travel of the web and at a predetermined angle of attack thereto;

a frame including first and second spaced supporting bars for pivotally supporting the doctor support member therebetween; and

pivoting means for mounting the doctor support member to the frame, the pivoting means being adapted to enable pivoting of the doctor support member to adjust the pressure exerted by the blade on the web and to automatically and simultaneously maintain the angle of attack of the blade edge on the web at said predetermined angle irrespective of the position of the doctor support member, the pivoting means including means for pivotably supporting the pivoting means on the first and second supporting bars and being adapted to pivot the support member about a first axis which passes through the blade of the doctor and to be movable relative to the web in a manner which enables adjustment of the force applied by the blade edge on the web, the doctor support member being mounted to the pivoting means at a location thereon which coincides with the position of a second axis located parallel to but eccentrically removed from the first axis, the second axis being transferrable around the first axis.

4,637,339

ELECTRODE ARRANGEMENT FOR A COATING INSTALLATION

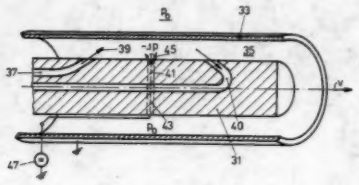
Felix Walser, Hinwil, Switzerland, assignor to Prazisions-Werkzeuge AG, Ruti, Switzerland

Filed Sep. 11, 1985, Ser. No. 774,701

Claims priority, application Switzerland, Sep. 11, 1984, 4335/84

Int. Cl.[4] B05D *1/06*

U.S. Cl. 118—622 3 Claims



1. A coating installation including a coating chamber in which a coating medium is propelled against an article to be coated, feeding means for feeding the coating medium into the coating chamber by a gas under pressure, thereby providing for a differential pressure within said chamber with respect to an ambient pressure around said installation outside said chamber, electrode means disposed within said coating chamber and connected to a means for applying an electric field between said electrode means and the article, conduit means leading into said chamber in an area of the electrode means and communicating with a pressure source to provide a gas stream to prevent the coating medium from affecting the electrode means, and wherein said pressure source is said differential pressure within said chamber with respect to the ambient pressure at a region of the coating installation outside said chamber providing for a purging gas stream between said chamber and said region.

4,637,340

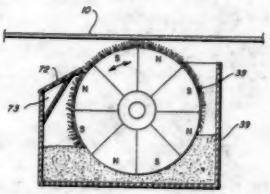
DEVELOPER METERING STRUCTURE

Michael D. Thompson, Rochester, and Clifford W. Imes, IV, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1985, Ser. No. 737,951

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 12 Claims



1. Printing apparatus for forming toner images on a charge-retentive surface which surface is moved past processing stations of the printing apparatus, said processing stations including a developer station where latent electrostatic images are rendered visible by the application of single component magnetic developer particles, said apparatus comprising:

developer apparatus positioned at said developer station and comprising a sump for containing a quantity of said single component magnetic developer;

a magnetic developer roll rotatably supported in said sump contiguous said charge-retentive surface whereby devel-

oper carried by said developer roll from said sump is presented to said charge-retentive surface; and

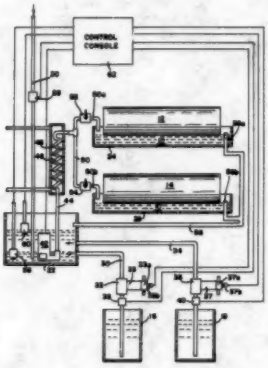
a blade member supported adjacent said developer roll and spaced apart therefrom such that said blade member contacts developer material only after it has been attracted to said developer roll, said blade being fabricated from a soft magnetic material capable of being vibrated due to the influence of the forces created by the magnetic fields created by the rotation of said magnetic developer roll, the degree of vibration of said blade member being insufficient to cause said blade member to contact said developer roll whereby agglomerated developer carried by said developer roller is broken up and the developer is metered to a predetermined height on said developer roll.

4,637,341

APPARATUS FOR APPLYING SILICONE EMULSION TO A PAPER WEB

Thomas G. Switall, Wheeling, Ill., assignor to Rayco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed Aug. 28, 1985, Ser. No. 770,104
Int. Cl.[4] B05C *11/10, 1/08*
U.S. Cl. 118—694 **5 Claims**



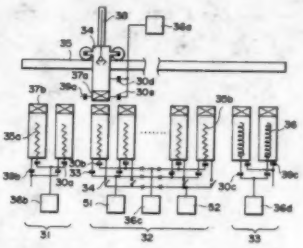
1. A silicone applicator for applying a controlled concentration of an aqueous silicone emulsion to a paper web as the web is moving through a printing press, said applicator comprising at least one silicone concentrate supply mixing tank, a water supply means for containing a supply of water, a mixing tank for mixing silicone concentrate with water to form an aqueous silicone emulsion of the desired concentration, a silicone holding tray for holding a supply of silicone emulsion, roller means for picking up the silicone emulsion from said holding tray and applying it to a paper web, water transfer means for transferring water from said water supply means to said mixing tank in sufficient quantity to fill said mixing tank to a predetermined level, and silicone transfer means for repetitively transferring measured charges of silicone concentrate to said mixing tank from said silicone concentrate supply tank, said water transfer means including low level liquid sensing means for sensing when the level of liquid in said mixing tank is below a predetermined low level, high level liquid sensing means for sensing when the level of liquid in said mixing tank is above a predetermined high level, and valve means responsive to said first and second sensing means for opening to charge water into said mixing tank when said liquid level reaches said low level and for closing to discontinue the charging of water when said liquid level reaches said high level, adjustable control means for controlling the amount of silicone concentrate transferred by said first transfer means to said mixing tank by controlling the number of measured charges of silicone concentrate delivered to said mixing tank for each filling of said mixing tank by said water transfer means, whereby the concentration of the aqueous silicone emulsion mixed in said mixing tank may be controlled, and second transfer means for delivering the controlled concentration of the mixed silicone emulsion from said mixing tank to said holding tray.

4,637,342

VACUUM PROCESSING APPARATUS

Osamu Kamiya, Machida; Yasutomo Fujiyama, Kawasaki; Kyosuke Ogawa, Tokyo, and Takashi Kurokawa, Ueno, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,522
Claims priority, application Japan, Mar. 2, 1984, 59-39896
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—719 **9 Claims**



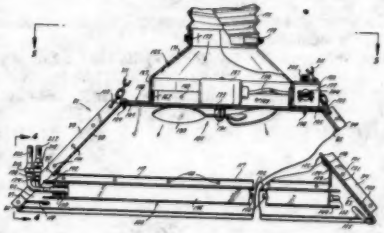
1. A vacuum processing apparatus for applying a vacuum working process to a substrate to be processed by a plurality of processing steps, characterized in that said apparatus comprises vacuum containers exclusively for use for processing disposed in place for each of said processing steps, and a vacuum container exclusively for use for conveyance movable between said vacuum containers exclusively for use for processing, said vacuum containers are provided with opening-closing gates which can be connected to each other, and said substrate to be processed is transferably movable between said vacuum containers exclusively for use for processing and said vacuum container exclusively for use for conveyance.

4,637,343

BROODER UNIT AND SYSTEM

Herbert W. Beck, Rte. 1, Box 303H, Farmington, Mo. 63640, and Ronald L. Franken, Rte. 1, Linn, Mo. 65051

Filed May 7, 1985, Ser. No. 731,508
Int. Cl.[4] A01K *31/19*
U.S. Cl. 119—31 **18 Claims**



1. A brooder system in a brooder building for applying heat to young animals such as chicks and the like comprising a plurality of brooder units, each unit having a hood with an air inlet and an air outlet, a hot liquid heat exchanger housed within the hood between the air inlet and outlet and extending over substantially the entire cross-sectional area of the hood at the location of the heat exchanger, and a fan housed within the

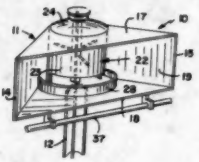
hood between the air inlet and heat exchanger for circulating air drawn into the inlet, over the heat exchanger, and spreading air over substantially the entire air outlet opening, the hood being tapered outwardly such that the air outlet is substantially larger in cross-section than the air inlet, means for supporting the brooder units with the air outlets opening downwardly and spaced a selected distance above the floor of the building, means for supplying hot liquid to the heat exchangers of the brooder units, and means for supplying electrical power to the fans of the units.

4,637,344

BIRD FEEDER

Luetta M. Peterson, Kankakee, Ill., assignor to Mainstay, Inc., Gilman, Ill.

Filed Oct. 4, 1985, Ser. No. 784,795
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—52 R **9 Claims**



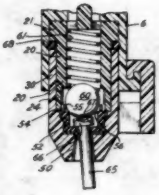
1. A bird feeder comprising, a horn-shaped housing having upstanding connected diverging walls, top and bottom walls, and an opening at the side opposite the connection of the diverging walls, a feed reservoir within the housing including a feed discharge slot therein at the lower end facing said opening, a retaining wall opposite said feed discharge slot to contain the flow of feed from the slot, said wall being in spaced relation to the opening such that said wall is inset within said housing, a vertically disposed shaft adapted to be supported to dispose the feeder above ground level for rotatably mounting the feeder, said shaft having a portion extending upwardly substantially throughout the feed reservoir and including a tubular bearing member surrounding said shaft portion, whereby the upstanding diverging walls function to respond to the wind and directionally rotate the feeder on the shaft so that the opening is away from the wind to shelter birds feeding at the discharge slot and also to protect the feed against inclement weather and from blowing out of the feeder.

4,637,345

WATERING SYSTEM FOR FOWL AND SMALL ANIMALS

Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., South Middlebury, Ind.

Continuation of Ser. No. 520,099, Apr. 10, 1981, which is a continuation of Ser. No. 113,607, Jan. 21, 1980, Pat. No. 4,284,036. This application Aug. 27, 1984, Ser. No. 644,612
Int. Cl.[4] A01K *7/06*
U.S. Cl. 119—72.5 **24 Claims**



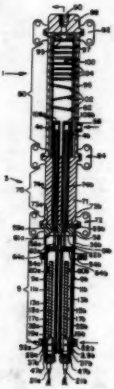
1. In a watering device for fowl and small animals, a valve housing adapted to be connected to a water supply line and having an inlet, an outlet and a valve chamber having a valve seat and a second seat therein, a valve member normally bearing on said valve seat, a valve actuator having clearance in and projecting from said outlet, said actuator having a head within said valve chamber and bearing on said second seat, said actuator head normally being positioned adjacent and confronting said valve member and having a concave surface with a leveraging edge confronting said valve member and positioned and interacting therewith such that said leveraging edge first engages said valve member off center so as to shift said valve member off from said valve seat by leveraged actuation upon tilting movement of said actuator head relative to said second seat caused by slight actuator movement and thereby permit fluid flow from said supply line through said outlet, and said valve member having a convex surface confronting and engageable by said concave surface of said actuator head.

4,637,346

COMPACT MODEL STEAM GENERATOR HAVING MULTIPLE PRIMARIES

Robert Draper, Churchill Boro; Donald G. Lorentz, Irwin; Allen J. Baum, Pittsburgh, and George Economy, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 17, 1985, Ser. No. 724,368
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 A **34 Claims**



1. An improved model steam generator for simultaneously simulating different sets of thermohydraulic conditions inside a full-scale steam generator in order to monitor the effect of these conditions on heat exchange tubes contained within a full-scale generator, comprising a boiler vessel having a primary and a secondary side, a plurality of sample heat exchange tubes for conducting heat from the primary to the secondary side, wherein said primary side includes a separate primary system for each sample tube, each of which circulates a flow of heated water within its respective tube for conducting heat to the secondary side of the boiler vessel, and a control means connected to each primary system for separately controlling the heat flux of each of the sample heat exchange tubes so that different heat exchange tubes transfer heat at different fluxes.

4,637,347

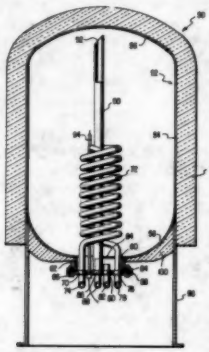
IMPROVED CONTINUOUS LOW FLUID EXCHANGE WATER HEATER

Leonard Troy, 212 Glenburn Rd., Clarks Summit, Pa. 18411

Filed Jul. 18, 1985, Ser. No. 756,322
Int. Cl.[4] F22B *21/00*
U.S. Cl. 122—20 A **6 Claims**

1. A water heater of the continuous flow, fluid heat ex-

change type wherein the boiler used to heat the heat exchange fluid is a separately contained unit connected by pipe means to said water heater, said water heater comprising a tank having a single opening, the opening located at the bottom of the tank,



a removable cover plate releasably sealing said opening, and all fluid connections to said tank being carried by said cover plate, one of said connections including a hot water outlet, said hot water outlet including an insulated elongated tube extending into an upper most section of said tank.

4,637,348

APPARATUS FOR CONTROLLING STARTING OPERATION OF BOILER

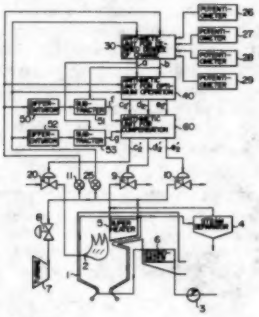
Yukio Fukayama, Hiroshima, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 754,963

Claims priority, application Japan, Jul. 16, 1984, 59-145932

Int. Cl.[4] F22B *35/04*

U.S. Cl. 122—406 ST **8 Claims**



1. An apparatus for controlling a starting operation of a boiler, the apparatus comprising:

a super heater means and a steam separator means;

a first valve means for bypassing steam of said super heater means;

a second valve means for bypassing steam from said super heater means to a portion other than a primary supply portion to be supplied with steam from said super heater means;

a third valve means for regulating a fuel flow to be supplied to a burner means;

a temperature detecting means for detecting a pressure of steam at a predetermined portion of the boiler;

pressure detecting means for detecting a pressure of steam in the boiler;

first arithmetic means for calculating a desired steam temperature change rate value represented by a preset constant or function of a signal with respect to thermal stress of a super heater outlet header and a desired steam pressure change rate value which is given by a preset constant or function of a signal representing thermal stress of said steam separator which are required for suppressing stresses to be generated in predetermined structural portions of the boiler, on the basis of said steam temperature, said steam pressure, a desired pressure increase value, and a desired temperature increase value; and

second arithmetic means for calculating manipulated variables of said first valve means, said second valve means and said third valve means, respectively, in dependence upon said steam temperature, said steam pressure, said desired steam temperature change rate value and said desired steam pressure change rate value obtained by said first arithmetic means.

4,637,349

BOILER CYCLING CONTROLLER

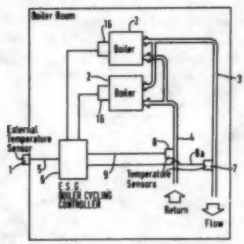
Anthony Robinson, London, England, assignor to E.S.G. Controls, Ltd., Cambridge, England

Filed Jul. 9, 1984, Ser. No. 628,992

Claims priority, application United Kingdom, Jul. 7, 1983, 8318452

Int. Cl.[4] F22B *35/00*

U.S. Cl. 122—448 B **7 Claims**

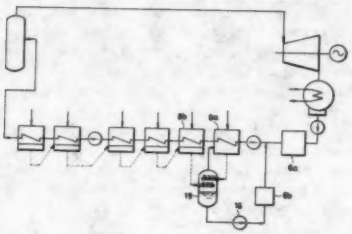


1. A system for controlling the operation of a heating boiler, comprising a thermostatic device continuously operable to switch off the boiler when the flow temperature of the boiler water reaches a predetermined maximum and selectively operable to switch on the boiler when the flow temperature falls to a fixed minimum, a boiler cycling controller connected at its input to devices for sensing the outside temperature and the boiler water temperature and selectively operable in response to the electrical signals received from said temperature sensing devices to switch on the boiler at temperatures which become progressively lower as the outside temperature rises, and a multi-position selector switch interposed between said thermostatic device and said boiler cycling controller on the one hand and the burner controls the boiler on the other hand, the arrangement being such that switching on of the boiler is controlled, in one position of the switch by said thermostatic device and in another position of the switch, by said boiler cycling controller.

4,637,350
SYSTEM FOR RECOVERING DRAIN

Youshun Horibe; Yoshikuni Ohshima, and Toyohiko Masuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,903
Claims priority, application Japan, Sep. 28, 1984, 59-201479
Int. Cl.[4] F22D *1/28, 1/32*
U.S. Cl. 122—441 12 Claims



1. A system for recovering drain, which is applied to a generating plant provided with feed-water heaters from which drain is recovered into a condensation system including a condenser, said system comprising:

a drain tank;

a high temperature drain inlet for drain to be recovered of high temperature, containing a considerable volume of flush steam, said high temperature drain inlet being provided on said drain tanks, and communicated with one of said feed-water heaters on a low pressure side;

a low temperature drain inlet for drain to be recovered, said low temperature drain inlet being provided on said drain tank to be positioned above said high temperature drain inlet and communicated with said feed-water heaters on a low temperature side;

a first spraying apparatus, provided in said drain tank so as to communicate with said high temperature drain inlet;

a second spraying apparatus provided in said drain tank so as to communicate with said low temperature drain inlet;

a vent outlet provided on said drain tank;

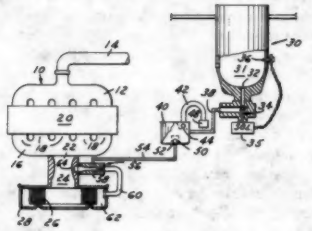
a drain outlet provided on said drain tank; and

a drain pump for transferring drain in said drain tank to said condensation system on the downstream side of said condenser.

4,637,351
SYSTEM FOR REMOVAL OF WATER FROM DIESEL FUEL SYSTEMS

Benjamin J. Pakula, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 28, 1986, Ser. No. 845,715
Int. Cl.[4] F02D *19/00;* F02M *25/04;* B01D *35/02*
U.S. Cl. 123—25 J 5 Claims

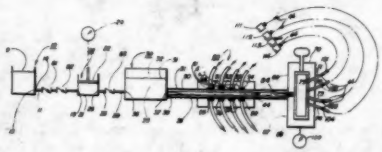


1. A system for automatically removing liquid contaminant-/water from a fuel filter of a diesel engine by the use of air flow through the engine, the filter having a drain opening at atmospheric pressure for removing water separated from the fuel, a drain line connected at one end to the drain opening and at its other end into a fluid aspirator, the aspirator when operable establishing a pressure differential therein sufficient to induce the drain water thereinto and therefrom, means connecting air that flows through the engine to and through the aspirator during engine operation to render the aspirator operable, and means connecting the water from the aspirator to a portion of the engine for disposal herein.

4,637,352
STEAM BOOSTED INTERNAL COMBUSTION ENGINE

Marion A. Green, P.O. Box 205, Kilbourne, La. 71253

Filed Feb. 7, 1983, Ser. No. 464,370
Int. Cl.[4] F02M *25/02*
U.S. Cl. 123—25 P 5 Claims



1. A device to supplement the power produced by burning fuel in an internal combustion engine with steam, said device comprising:

a means for producing a constant flow of water past a boiler means;

a means for allowing the said water to flow in the direction of the said boiler;

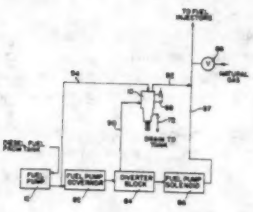
a boiler means external to the said internal combustion engine to convert the said water into superheated steam; a means for controlling the pressure of the said water such that the said water pressure is greater than the pressure of the said steam produced by the said boiler; and

a means for injection of the said superheated steam directly into a cylinder of the said internal combustion engine, a means for producing a constant flow of water at a pressure greater than the pressure of said superheated steam, wherein said constant flow means at greater pressure comprises a chamber with a gaseous component, with said gaseous component being of constant volume and exerting constant pressure upon water within the said chamber.

4,637,353
PILOT FUEL REGULATING DEVICE

Ernest R. Codrington, 1580 Cornell Avenue, Coquitlam, British Columbia V3J 3A1, Canada

Filed Feb. 6, 1984, Ser. No. 577,288
Int. Cl.[4] F02M *21/02, 43/00*
U.S. Cl. 123—27 GE 1 Claim



1. A fuel system for use in a diesel engine converted to burn

a fuel mixture of natural gas and a pilot fuel, the fuel system including a fuel pump coupled to the engine drive shaft for supplying pilot fuel to the engine at pressures proportional to the speed of the engine, wherein the improvement comprises:

a pilot fuel governor in fluid comminication with the fuel pump for regulating the flow of pilot fuel to the engine when the pilot fuel governor is actuated, the pilot fuel governor comprising:

a main body having an elongated bore;

an inflow passageway extending between the exterior of the main body and the bore for the passage of incoming fuel into the bore;

an outflow passageway extending between the bore and the exterior of the main body for the passage of outgoing fuel from the bore;

a piston slidably mounted in the bore to regulate the flow of fuel passing through the bore, the piston including a major diameter portion, a minor diameter portion and a contoured portion therebetween which are alignable in a plurality of positions with respect to the inflow passageway and outflow passageway to define a control passage in the bore which permits a preset amount of fuel to pass between the inflow passageway and the outflow passageway, the preset amount varying and being determined by the longitudinal position of the piston within the bore;

means for biasing a piston toward a first end of the bore; the fuel pump communicating with the piston to oppose the biasing means and displace the piston toward the second end of the bore when the speed of the engine creates sufficient pressure;

an alternate pilot fuel path for supplying unregulated amounts of fuel to the engine when the pilot fuel governor is deactivated; and

means for alternately activating the pilot fuel governor and alternate pilot fuel path such that when the pilot fuel governor is activated, a regulated amount of pilot fuel will flow to the engine, and when the alternate pilot fuel path is activated, an unregulated amount of pilot fuel will flow to the engine for use as a primary fuel source.

4,637,354

V TYPE MOTORCYCLE ENGINE AND TRANSMISSION

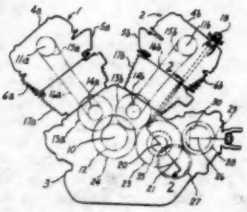
Nobuyoshi Tominaga, Hamamatsu; Nobuyoshi Kurai, Iwata; Hajime Ueno, Shizuoka, and Sadahide Suzuki, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 20, 1981, Ser. No. 236,614

Claims priority, application Japan, Feb. 23, 1980, 55-21916

Int. Cl.[4] F02B *75/22*; F02F *7/00*

U.S. Cl. 123—55 VF **1 Claim**



1. In a motorcycle having a forward axis: a V-type internal combustion engine having a crank case with a crank case wall, two cylinders with their axes lying at an angle between planes horizontal to and vertical to the engine, said cylinders, lying in respective vertical planes parallel to the forward axis and forming a V when viewed from a side, and a crank shaft with a laterally extending axis; a transmission having a main shaft with an axis parallel to the crankshaft axis, rearward of it, and below it; and a plurality of stud bolts extending through said cylinders and threaded into the crank case wall, said wall, where the stud bolt approaches said main shaft, being thickened to provide strength for the threads, the orientation of the main shaft relative to the crank shaft enabling the thickness to be provided without interference between crank case and gears on the main shaft.

4,637,355

SEPARATE LUBRICATING SYSTEM FOR OUTBOARD MOTORS

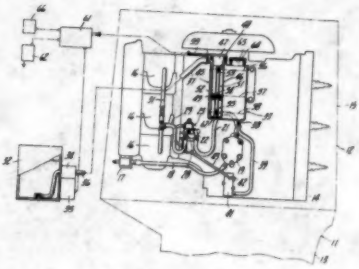
Rou Odashima, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka and Yamaha Hatsudoki Kabushiki Kaisha, Iwata, both of, Japan

Continuation of Ser. No. 606,300, May 2, 1984, abandoned, which is a division of Ser. No. 475,£37, Mar. 16, 1983, Pat. No. 4,471,727. This application Oct. 9, 1985, Ser. No. 786,158

Claims priority, application Japan, Apr. 6, 1982, 57-56042

Int. Cl.[4] F01M *3/00*

U.S. Cl. 123—73 AD **8 Claims**



1. In an induction system for a two-cycle engine including a carburetor for discharging a fuel/air mixture into an induction passage associated with the engine having a fuel bowl and fuel delivery means extending from the fuel bowl to the induction passage, a fuel tank positioned remotely from said carburetor and a lubricant tank separate from said carburetor and from said fuel tank, the improvement comprising a mixing chamber positioned externally of said carburetor and in proximity thereto, said mixing chamber being defined within an outer housing, fuel pump means separate from said mixing chamber and driven by said engine for delivering fuel from said fuel tank to said mixing chamber under pressure continuously upon running of the engine, lubricant pump means separate from said mixing chamber and said fuel pump means and driven by said engine for delivering lubricant from said lubricant tank under pressure to said mixing chamber, and conduit means for delivering a premixed fuel/lubricant mixture from said mixing chamber to said carburetor.

4,637,356

VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Yuuzoh Kuroda, Kakegawa, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 19, 1985, Ser. No. 746,380

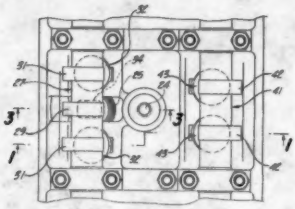
Claims priority, application Japan, Aug. 15, 1984, 59-169378

Int. Cl.[4] F01L *1/26*

U.S. Cl. 123—90.27 **4 Claims**

1. An internal combustion engine comprising a cylinder having a bore, a cylinder head fixed relative to said cylinder, three poppet type valves supported by said cylinder head for reciprocation about respective axes all positioned on the same side of a plane containing the axis of said cylinder bore, a single camshaft having three respective cam lobes each associated with a respective of said valves, said camshaft being rotatable

about an axis extending parallel to said plane and lying on said same side thereof as said valve axes, rocker arms means associated with one of the cam lobes for operating its associated valve, and means for directly operating the remainder of said valves from the remaining cam lobes.

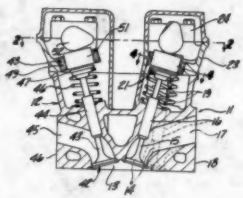


4,637,357

TAPPET ARRANGEMENT FOR ENGINE VALVE TRAIN

Masatoshi Ohmi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 29, 1985, Ser. No. 728,094
Int. Cl.[4] F01L *1/14, 1/26*
U.S. Cl. 123—90.48 **13 Claims**



1. In a valve arrangement for an internal combustion engine comprising a cylinder head assembly, a plurality of poppet valves supported by said cylinder head assembly at one side thereof for reciprocation between opened and closed positions, said valves being juxtaposed to each other, a camshaft, and a plurality of slidably supported tappets supported by said cylinder head assembly and each interposed between said camshaft and a respective one of said valves, the improvement comprising at least one of said tappets being non-circular in cross-sections taken perpendicular to its line of reciprocation and having a short dimension extending in the direction of the adjacent valves and a long dimension extending in the perpendicular direction, the distance between said valves being less than said long dimension.

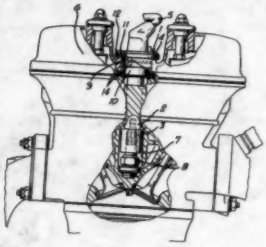
4,637,358

SPARK PLUG CAP APPARATUS

Yoshiki Yano, Saitama, and Toshihiro Oikawa, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1985, Ser. No. 781,247
Claims priority, application Japan, Sep. 27, 1984, 59-144992[U]; Sep. 27, 1984, 59-144991[U]
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—169 PA **14 Claims**

1. A spark plug cap apparatus for an engine having an elongated and generally vertical spark plug bore having an upper open end, comprising, an upwardly extending annular protrusion on said upper open end of the bore, a cover means including a flange with means for extending over and sealably engaging an outer surface of said annular protrusion, and said cover



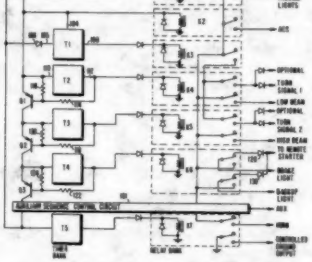
means having a downwardly extending seal lip for sealably engaing an inner surface of the bore.

4,637,359

ELECTRONIC DETECTION DEVICE FOR MOTORIZED VEHICLES

Norman E. Cook, Rte. 13, McCloud Rd., Knoxville, Tenn. 37938

Continuation-in-part of Ser. No. 556,989, Dec. 1, 1983. This application Mar. 4, 1985, Ser. No. 707,968
Int. Cl.[4] F02N *11/08*
U.S. Cl. 123—179 B **10 Claims**



6. A method of automatically detecting the condition of electrical system components of a vehicle having a battery and a plurality of electrical system components, said method comprising the steps:

(a) generating an actuation signal at a location remote from said vehicle;

(b) selectively supplying power to a plurality of electrical system components including vehicle headlights, indicator lights and horn, said supplying step including energizing particular ones of said electrical system components through a plurality of separately actuatable switch means;

(c) actuating said plurality of switch means in a predetermined sequence in response to said actuation signal, and

(d) maintaining at least one of said electrical system components deenergized at any one time during the predetermined sequence,

wherein said actuating step includes sequencing entirely through the predetermined sequence in response to said actuation signal,

whereby all of said electrical system components are automatically energized in response to a single actuation signal while the instantaneous current drain from the battery of said vehicle is limited.

10. The method of claim 9 wherein said vehicle includes an internal combustion engine and a starter circuit for starting said engine, said method further comprising the step:

(i) conducting current from said battery to said starter circuit in response to reception of said actuation signal and before commencing said actuating step,

whereby said vehicle engine is running when said actuating step is performed.

4,637,360

RECOIL STARTER

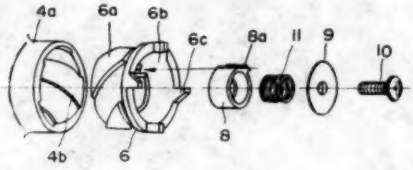
Mitsuo Osakabe, Tokyo, Japan, assignor to Starting Industry Company Limited, Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,034

Claims priority, application Japan, Mar. 12, 1984, 59-255411

Int. Cl.⁴ F02N *5/02*

U.S. Cl. 123—185 A **8 Claims**



1. A recoil starter comprising:

a supporting shaft mounted within a housing;

a reel which is loosely fitted for rotation around said supporting shaft;

a cylindrical hub portion carried integrally by said reel;

a clutch cylinder loosely fitted in coaxial relation on said cylindrical hub portion, said hub portion and said cylinder having a cooperating spiral spline and groove connection whereby relative rotation causes axial projection and retraction of said clutch cylinder;

a plurality of generally axial projections provided at the fore end of said clutch cylinder in a position opposing a plurality of recesses provided integrally with a flywheel which is attached to the end portion of a crankshaft of an engine, for engagement upon projection of said clutch cylinder;

an axially extending notch on said clutch cylinder extending part of the axial length thereof;

means mechanically engaged in said notch to permit relative axial displacement of said clutch cylinder; and

friction means acting on said notch engaging means to brake the same against rotation and thus the clutch cylinder to thereby effect relative rotation of said hub portion and clutch cylinder to project the latter into flywheel engaging position.

4,637,361

NON-ADJUSTABLE THROTTLE POSITION INDICATOR

H. Ron Killen, Rochester; Scott A. Wilkins, Royal Oak, and Douglas C. Frantz, Berkley, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Continuation of Ser. No. 620,350, Jun. 13, 1984, abandoned. This application Jan. 30, 1986, Ser. No. 824,024

Int. Cl.⁴ F02M *3/00*

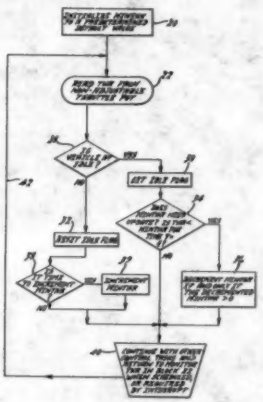
U.S. Cl. 123—339 **8 Claims**

1. In a vehicle having an engine with a throttle means to regulate flow of combustible elements into the engine, engine control means, means for monitoring and storing various engine parameters and other data and means for storing predetermined values and default values and transfer functions, a throttle position indicator with a variable electrical output in communication with the throttle means such that movement of the throttle means translates to a change in the variable electrical output of the indicator, and stored values of predetermined data and values, including default values for minimum acceptable throttle position, tolerance values for acceptable minimum throttle position, increment and decrement amounts for changing the minimum acceptable throttle position values, a method for indicating throttle position comprising:

sensing the actual throttle position as a function of the electrical output of the indicator;

defining a predetermined default value as the minimum acceptable throttle position value;

determining whether the vehicle is at idle and storing the determination;



comparing the actual throttle position to the minimum acceptable throttle position value to decide whether to update the minimum acceptable throttle position value; and

if and only if the vehicle is at idle and if the minimum acceptable throttle position value needs updating, reducing, by a predetermined decrement amount, the minimum acceptable throttle position value if and only if the minimum acceptable throttle position value would be greater than zero after reducing.

4,637,362

METHOD FOR CONTROLLING THE SUPPLY OF FUEL FOR AN INTERNAL COMBUSTION ENGINE

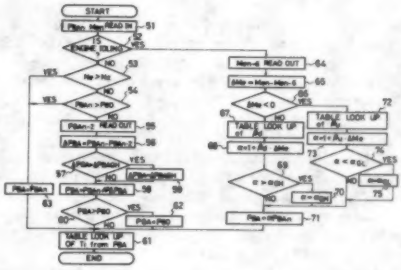
Akimasa Yasuoka, Tokyo; Takahiro Iwata, and Takeo Kiuchi, both of Asaka, all of Japan, assignors to Honda Kiken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,117

Claims priority, application Japan, Mar. 29, 1984, 59-061648

Int. Cl.⁴ F02M *5/02*

U.S. Cl. 123—478 **18 Claims**



1. A method for controlling fuel supply of an internal combustion engine having a throttle valve and fuel supply means,

according to the pressure within an intake pipe, comprising the steps of:

(a) sampling said pressure within the intake pipe, with a pressure sensing means, and sampling a value corresponding to the internal combustion engine rotational speed, with a rotational sensing means, at predetermined sampling intervals;

(b) producing a subtraction falue ΔM_e by subtracting from the latest sampled value M_{en}, of said value corresponding to engine rotational speed, a sampled value M_{en-m} which was sampled at a sampling time a predetermined number (m) of cycles before a sampling time of the latest sampled value M_{en};

(c) producing a corrected value P_{BA} by correcting a latest sampled value P_{BAn} of said pressure within the intake pipe according to said subtraction value ΔM_e;

(d) determining a fuel supply amount according to the said corrected value P_{BA}; and

(e) driving said fuel supply means for supplying a fuel to the internal combustion engine in response to said fuel supply amount determined according to said corrected value P_{BA}.

4,637,363

MULTI-CYLINDER INTERNAL-COMBUSTION ENGINE CONTROL DEVICE

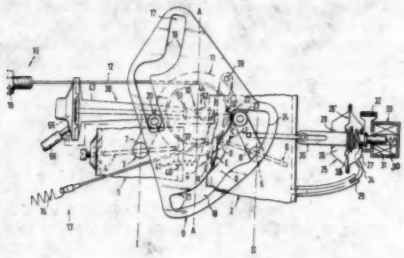
Wolfgang Schmid, Markgröningen, Fed. Rep. of Germany, assignor to Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,449

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407000

Int. Cl.[4] F02D *17/02*

U.S. Cl. 123—481 **19 Claims**



1. In a motor vehicle having a transmission and a gas pedal, a multi-cylinder internal-combustion engine comprising:

at least two cylinder groups, each cylinder group having an intake pipe including a throttle valve attached to a throttle valve shaft; a control lever attached to each throttle valve shaft;

a cam plate connected to the gas pedal for interacting with the control levers to vary the positions of the throttle valves such that the first cylinder group throttle valve opens in a substantially direct relation to an increase in the gas pedal position whereas the opening of the second cylinder group throttle valve is delayed until the gas pedal passes a predetermined position; and

an overriding means responsive to a selective input for overriding the position of the second cylinder group throttle valve such that when activated, said overriding means causes the second cylinder group throttle valve to open in relation to an increasing gas pedal position before the gas pedal reaches said predetermined position;

wherein said overriding means includes a radial cam attached to said cam plate for opening said second cylinder group throttle valve a sufficient distance to admit a quantity of a fuel-air mixture which is approximately one-half of the quantity admitted by the first cylinder group throttle valve.

4,637,364

METHOD FOR CONTROLLING AIR-FUEL RATIO FOR INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR

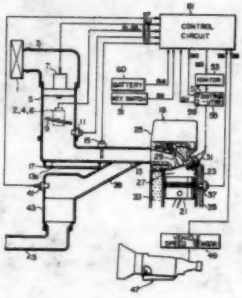
Shinichi Abe, Toyota, and Toshiaki Mizuno, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 597,096, Apr. 5, 1984, abandoned. This application Aug. 23, 1985, Ser. No. 768,925

Claims priority, application Japan, Apr. 12, 1983, 58-64188

Int. Cl.[4] F02B *3/80*

U.S. Cl. 123—492 **10 Claims**



1. A method of controlling the air fuel ratio of an air-fuel mixture to be supplied to an internal combustion engine comprising the steps of:

(a) detecting and determining that the engine is operating under a first operational state wherein conditions exist where a cooling water temperature is greater than a predetermined cooling water temperature, an engine load is less than a predetermined engine load and a vehicle speed is greater than a first operational condition of a predetermined vehicle speed;

(b) detecting said vehicle speed and determining if an additional first operational condition exists wherein said vehicle speed is less than a second predetermined vehicle speed wherein said second predetermined vehicle speed is greater than said first predetermined vehicle speed;

(c) detecting an engine acceleration and determining if a second additional operational condition exists wherein an acceleration of the engine is commencing; and

(d) determining said air-fuel ratio such that when at least said first operational state exists, the air-fuel ratio is adjusted to the lean side of stroichiometric, and if both first and second additional operational conditions exist, the air-fuel ratio is adjusted towards substantially stoichiometric.

4,637,365

FUEL CONDITIONING APPARATUS AND METHOD

Henry Yunick, Daytona Beach, Fla., assignor to MotorTech, Inc., Daytona Beach, Fla.

Continuation-in-part of Ser. No. 622,409, Jun. 22, 1984, Pat. No. 4,503,833, which is a continuation of Ser. No. 312,495, Oct. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 247,066, Mar. 24, 1981, abandoned. This application Oct. 22, 1984, Ser. No. 663,552

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—545 **7 Claims**

1. A fuel vaporizing apparatus for a spark ignition, internal combustion engine, comprising:

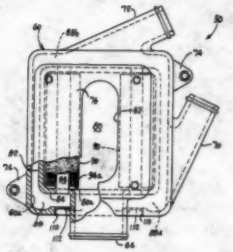
(a) outer structure defining an outer housing including a carburetor mounting plate, outer side walls and an outer

bottom wall, enclosing said side walls, said structure further defining a housing inlet for receiving engine coolant and a housing outlet for discharging said coolant after passing through at least a portion of said housing;

(b) inner structure defining an inner vaporization chamber including inner side walls, spaced a predetermined distance from said outer side walls and an inner bottom wall spaced a predetermined distance from the outer bottom wall such that a fluid jacket is defined between an inner surface of said outer housing and an outer surface of said inner chamber, said fluid jacket arranged in fluid communication with said inlet and said outlet;

(c) said carburetor mounting a plate defining an inlet opening spaced above and located in confronting relation with said inner bottom wall, said inlet opening communicating with said chamber for receiving air and entrained fuel discharged by a carburetor;

(d) said chamber extending into fluid communication with a chamber outlet for discharging a fuel mixture from said chamber, said chamber outlet having an axis that is substantially orthogonal to an axis defined by said inlet opening;



(e) heat exchange members disposed in said chamber in fluid communication with said fluid jacket, each heat exchange member including a supply tube through which said coolant is conveyed and a plurality of spine-like heat exchanger surfaces extending radially from said supply tube, and located in heat exchange relationship with the fuel mixture in said chamber;

(f) said heat exchange members being disposed on either side of said inlet opening and in a region of said chamber that is outside a direct flow path defined between said fuel mixture inlet and said fuel mixture outlet whereby said fuel mixture entering said chamber through said inlet is initially heated by impinging on said heated inner bottom wall causing said fuel mixture to expand, reducing its velocity and increasing its pressure such that at least a portion of said fuel mixture travels towards the heat exchange members and circulates around said members before exiting said chamber through said chamber outlet.

4,637,366

FUEL INJECTION APPARATUS AND SYSTEM

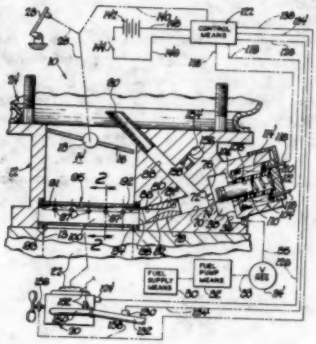
Warren H. Cowles, Farmington Hills, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,387

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—568 **21 Claims**

1. Fuel metering apparatus for supplying metered rates of fuel flow to a combustion engine, comprising body means, induction passage means formed through said body means for supplying motive fluid to said engine, throttle valve means situated in said induction passage means for variably controlling the rate of flow of air through said induction passage means, fuel-air mixture discharge means situated for discharge into said induction passage means, air passage means communicating between a source of air and said fuel-air mixture discharge means, said air passage means comprising flow restriction means, said flow restriction means being calibrated as to provide for sonic flow therethrough at conditions of idle engine operation, fuel metering means for metering liquid fuel in response to engine demands and indicia of engine operation, all of said liquid fuel when metered by said fuel metering means being discharged into air flowing through said air passage means at an area thereof downstream of said source of air and upstream of said flow restriction means as to flow through said flow restriction means, wherein said air flowing through said air passage means and said liquid fuel discharged into said air flowing through said air passage means comprises said fuel-air



mixture, a source of engine exhaust gas produced by said engine, and additional calibrated flow restriction passage means for flowing a portion of said engine exhaust gas from said source of engine exhaust gas to said air passage means at an area thereof downstream of said source of air and upstream of said flow restriction means, wherein the volumetric rate of flow through said flow restriction means is such as would during idle engine operation provide for an excessive rate of flow therethrough of said air within said fuel-air mixture, and wherein said portion of said engine exhaust gas serves to prevent said excessive rate of flow of said air by displacement thereof.

4,637,367

CRANKCASE EMISSION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

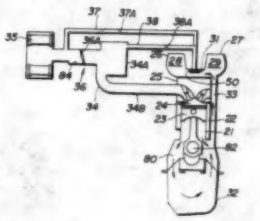
Masato Hatakenaka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Mar. 7, 1985, Ser. No. 709,379

Claims priority, application Japan, Mar. 14, 1985, 59-37183[U]

Int. Cl.[4] F01M *13/00*

U.S. Cl. 123—572 **5 Claims**



1. A crankcase emission control system for an internal combustion engine having an air intake passage and a throttle valve disposed in the air intake passage, the system comprising:

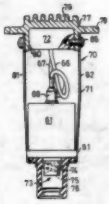
(a) a first cam cover defining at least part of a first cam chamber;
(b) a second cam cover defining at least part of a second cam chamber juxtaposed with respect to the first cam chamber;
(c) means for conducting blow-by gas to the first and second cam chambers;
(d) a first communication passage connecting a first pair of opposing ends of the first and second cam chambers;
(e) a second communication passage connecting a second pair of opposing ends of the first and second cam chambers;
(f) a first gas passage connecting the first communication passage and a point of the air intake passage upstream of the throttle valve;
(g) a second gas passage connecting the second communication passage and a point of the air intake passage downstream of the throttle valve;
(h) means disposed essentially at the connection between the first gas passage and the first communication passage for trapping oil; and
(i) means disposed essentially at the connection between the second gas passage and the second communication passage for trapping oil.

4,637,368

IGNITION SYSTEM FOR AN OTTO-TYPE FOUR-STROKE ENGINE

Per Sune Gillbrand, Enhörna, and Sven H. Johansson, Åmål, both of Sweden, assignors to Saab-Scania Aktiebolag, Sweden

PCT No. PCT/SE83/00256, § 371 Date Mar. 1, 1984, § 102(e) Date Mar. 1, 1984, PCT Pub. No. WO84/00402, PCT Pub. Date Feb. 2, 1984
PCT Filed Jun. 20, 1983, Ser. No. 590,580
Claims priority, application Sweden, Jul. 9, 1982, 8204248
Int. Cl.[4] F02P *3/06, 15/00*
U.S. Cl. 123—647 **31 Claims**



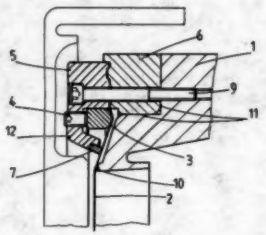
1. An ignition system for a multi-cylinder Otto-type four-stroke engine equipped with at least one spark plug per cylinder, the ignition system comprising:
for each spark plug, a respective ignition device connectible to said spark plug in the engine without cables;
an electrical high-voltage block;
an electrical low-voltage block including an electronic control unit which sends signals to the high-voltage block in response to the operating conditions of the engine for triggering sparks at the spark plugs in a predetermined order;
at least one common, handleable ignition cassette unit, the respective ignition devices of at least two of the spark plugs being included in one common, ignition cassette unit; the high-voltage block being included in at least one common ignition cassette unit.

4,637,369

APPARATUS FOR SPANNING A CENTER-OPENING SAW BLADE

Harald Petermann, and Peter Bauer, both of Nuremberg, Fed. Rep. of Germany, assignors to GMN Georg Muller Nurnberg GmbH, Fed. Rep. of Germany

Filed Nov. 22, 1985, Ser. No. 801,099
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442730
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 **6 Claims**



1. Apparatus for tensioning a center-opening saw blade having an inner sawing edge, the saw blade to be mounted on a spindle flange of a sawing machine, comprising:
two clamping collars having respective clamping surfaces;
means for releasably connecting said clamping collars to one another at a location remote from the sawing machine so as to clamp an outer peripheral edge region of the saw blade between said clamping surfaces and for said collars and said saw blade together to form an assembly adapted to be mounted over the spindle flange;
a tensioning ring adapted to be mounted onto the spindle flange and having an inner circular edge and an outer centering heel extending around a peripheral region thereof;
means for tightly affixing said assembly to said tensioning ring with at least one of said clamping collars being positioned in said centering heel and an inner region of said saw blade engaging said inner edge of said tensioning ring to impart an initial stress to said saw blade;
a form ring axially slidably mounted within said assembly; and
means for axially sliding said form ring relative to said assembly to engage an intermediate portion of the saw blade which is situated between the outer peripheral edge region and said inner region of said saw blade to impart a fine adjustment stress to the saw blade.

4,637,370

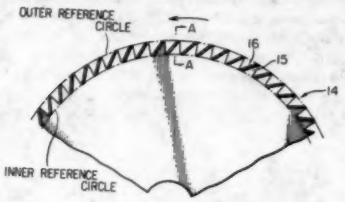
ROTARY SAW BLADE

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,446
Claims priority, application Japan, Oct. 8, 1984, 59-211086
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 **9 Claims**

1. A rotary saw blade, comprising a series of outward tapering toothlike radial projections on and around a circular core

of a base plate of metal, each of said projections comprising a leading surface which is inclined at an angle not greater than



60° to the periphery of the core and deposited with abrasive particles held in an electro-deposited layer of metal.

4,637,371

FUEL-OPERATED HEATING SYSTEM, PARTICULARLY AN AUXILIARY HEATER FOR A VEHICLE

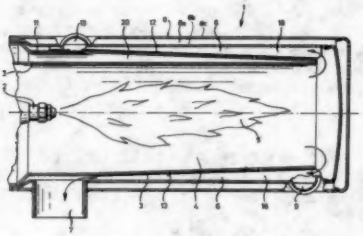
Dieter Räthel, Mittelstetten, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,230

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341490

Int. Cl.⁴ F24H *3/06*

U.S. Cl. 126—110 B **18 Claims**



1. An auxiliary heater for vehicles having a burner projecting into a first end of a combustion chamber formed by a combustion tube having an open end, located opposite said first end, from which combustion gases produced by said burner flow out of the combustion chamber; a heat exchanger having an inner chamber for a heat transfer medium and surrounding the combustion tube in a jacket-like manner with an annular out-flow space being located therebetween for directing combustion gases coming out of an open end of the combustion tube, in a flow direction from said open end toward said first end of the combustion tube, to an exhaust outlet in heat exchange realtionship with the heat transfer medium within said heat exchanger; and longitudinally extending fins projecting from a wall of said heat exchanger into said annular out-flow space; wherein the cross-sectional flow-through area of the annular out-flow space is reduced in a direction from said open end of the combustion tube toward said exhaust outlet by increasing the diameter of a boundary wall defining the inner circumference of the out-flow space; wherein the fins project a distance which decreases in correspondence to the reduction of said cross-sectional, flow-through area; and wherein the combustion chamber has a constant diameter substantially throughout its length and wherein a radial distance between said annular out-flow space and said combustion chamber is increased in direct correspondence to the reduction in flow-through area of the annular out-flow space along with a decrease in the ability for heat to be transferred from said combustion chamber to said annular out-flow space.

4,637,372

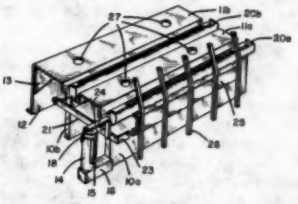
SIMULATED LOG-BURNING FIREPLACE

Gerald M. Mogol, 2169 Edgecumbe Rd., St. Paul, Minn. 55116, and Leo E. Fox, 357 Stonebridge Blvd., St. Paul, Minn. 55105

Filed Sep. 14, 1981, Ser. No. 302,039

Int. Cl.⁴ F24C *3/00*

U.S. Cl. 126—127 **2 Claims**



1. A simulated log-burning fireplace for resting on a supporting floor, comprising:

elongated, open-top, rectangular, box-like burner means for containing liquid fuel, said burner means comprising at least two parallel spaced-apart box-like chambers;

support means located adjacent the top but not over the top of the burner means between said chambers for holding a non-combustible artificial log;

a filling tube connected to said burner means for filling said burner means with liquid fuel;

a cap on said filler tube;

a movable arm, said arm extended over said cap in one position for keeping the cap closed and removed from said cap in another position to permit the cap to be opened;

closure means located at the top of said burner means for closing the top opening of said burner means;

said burner means having a height substantially from the supporting floor to said log support means and a width substantially that of the length of an artificial log.

4,637,373

OVEN

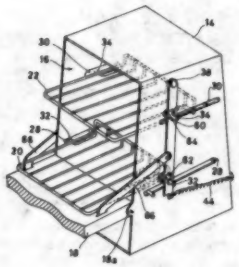
Yoshinari Shirai, Osaka, and Tutomu Kuranaga, Hyogo, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Oct. 17, 1984, Ser. No. 661,678

Claims priority, application Japan, Nov. 16, 1983, 58-177667[U]; Jan. 19, 1984, 59-8321

Int. Cl.⁴ F24C *15/16*

U.S. Cl. 126—340 **4 Claims**



1. An oven comprising:

a casing having an opening at its front side, said casing defining a baking chamber,

a first rack having a projection extending from a side thereof

and supported in the baking chamber in a manner allowing it to be shifted in a horizontal direction,

a connecting member pivotally mounted on the casing, the connecting member including a first L-shaped opening formed therein for receiving the projection of the rack,

a door pivotally mounted on the casing at its lower end, said door covering the opening of the casing when the door is closed, and

an arm for connecting the door and the connecting member so as to effect movement of the rack in the horizontal direction in response to opening and closing the door,

said projection being slidably received by the L-shaped opening, whereby the projection is adapted to freely slide within the L-shaped opening when the oven door is pivoted between a closed position and a predetermined position to prevent horizontal movement of the rack, and whereby the projection is prevented from sliding within the L-shaped opening when the oven door is pivoted between the predetermined position and a fully opened position to effect horizontal movement of the rack.

4,637,374

SELECTIVE ABSORPTION FILM OF A SOLAR HEAT COLLECTOR

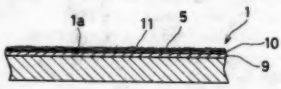
Nobushige Arai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1983, Ser. No. 530,264

Claims priority, application Japan, Sep. 8, 1982, 57-156429; Sep. 24, 1982, 57-166857; Nov. 30, 1982, 57-210357; Nov. 30, 1982, 57-181732[U]

Int. Cl.[4] F24J *2/00*; B05D *3/02*

U.S. Cl. 126—417 **5 Claims**



1. A solar heat collector comprising:

a heat collection fin made of a heat collection material; and

a selective absorption film formed on a heat collection surface of said heat collection fin and selectively absorbing solar rays, said selective absorption film comprising a plated layer primarily including cobalt, disposed on said heat collection fin and a cobalt oxide layer disposed on said plated layer, said absorption film having an absorption rate (α) of 0.91 to 0.96 percent and a radiation rate of 0.06 to 0.10 percent, even when the selective absorption film is exposed to a temperature of about 400° C. and wherein said plated layer contains an iron component.

4,637,375

INTEGRATED SOLAR HEATING UNIT

William J. Larkin, 2622 Newport Blvd., Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 737,864, May 28, 1985, Pat. No. 4,567,878. This application Jan. 31, 1986, Ser. No. 824,877

Int. Cl.[4] F24J *2/44*

U.S. Cl. 126—434 **7 Claims**

1. An integral solar heating unit with an integral solar collector and hot water storage system, said unit comprising:

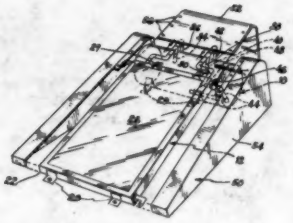
(a) a housing;

(b) a flat plate solar collector panel mounted in said housing and having a generally horizontal upper edge and an uninsulated, open back surface;

(c) a cylindrical hot water tank operatively connected to said solar collector panel and mounted in said housing generally parallel to and adjacent to said upper edge;

(d) said housing comprising a hood around said tank a pair of side skirts extending down at the sides of said panel, said hood and side skirts terminating at lower edges which together substantially define a plane such that upon placing said heating unit on a generally planar surface, said housing substantially encapsulates said collector panel and hot water tank in a substantially enclosed air space;

(e) said collector including a plurality of longitudinally extended U-shaped collector tubes and a glazed window to pass radiation through to said collector tubes, and a first cold water manifold connected to said tubes for delivering fresh water thereto and a second hot water manifold



connected to said tubes to remove heated water therefrom, and said manifolds are adjacent and at least somewhat above and in direct thermal contact with said tank; and,

(f) said skirts and hood lapping around said collector panel, exposing only said glazed window, such that everything else in said heating unit is enclosed by said housing such that heat emanating from the uninsulated, open back face of the collector and tank is captured and retained by said housing to warm said manifolds.

4,637,376

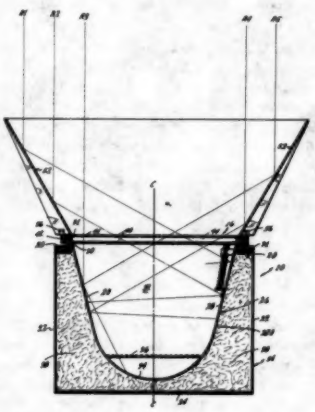
HIGH EFFICIENCY SOLAR HEATER

J. Arnold Varney, 7326 Ogelsby Ave., Los Angeles, Calif. 90045, and Frederick M. Varney, Rte. 9, Box 89FV, Santa Fe, N. Mex. 87501

Filed Jul. 8, 1985, Ser. No. 752,923

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—451 **5 Claims**



1. A solar oven comprising a plurality of canted side-walls defining a heating chamber of inverted pyramidal configuration having a rectangular upper aperture for admitting solar radiation into said chamber, a closed bottom, said side walls

having four blackened non-reflective interior surfaces and translucent means closing said upper aperture for containing heated air within said chamber, said four interior surfaces being exposed to radiation entering said chamber through said translucent means, a frusto-pyramidal reflector removably mounted externally of said heating chamber and including four reflector surfaces diverging from each other at a somewhat greater angle than said interior surfaces such that light falling onto said external reflector substantially normally to said translucent means is reflected onto an opposite one of said interior surfaces substantially at right angles thereto; and

temperature responsive means arranged for opening a vent into said chamber in response to temperature rising in said chamber beyond a predetermined level, said temperature responsive means comprising spring means retained in a compressed state by structural means selected to lose structural integrity near said predetermined level, said spring means being released upon said structural means losing structural integrity near said predetermined level and failing under load imposed by said spring means, whereby said spring means is free to operate to open said vent.

4,637,377

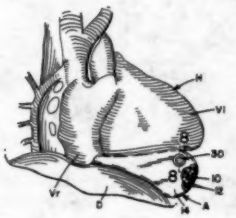
PILLOW OR SUPPORT MEMBER FOR SURGICAL USE

Floyd D. Loop, 1 Bratenahl Pl., #1206, Cleveland, Ohio 44108

Filed Sep. 20, 1985, Ser. No. 778,544

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 R **3 Claims**



1. The method of performing open heart surgery on a patient including the step of lifting the heart from the pericardial cavity of the patient and then resting the heart against a surgical pillow of generally flat shape inserted between the heart and the diaphragm of the patient and comprised of an inner cushion filler formed of a material comprising one from the group consisting of an aggregate of foamed plastic particles or a foamed spongy body of aeriferous cellular plastic or rubber material completely enclosed and sealed within an envelope comprised of a thin flaccid synthetic plastic sheet material impervious to air and liquid and nonabsorbent of blood and provided with vent means in the side edge wall of the envelope for releasing entrapped air or gas from the pillow on compression thereof.

4,637,378

CLEANING APPARATUS FOR ENDOSCOPE

Hiroyuki Sasa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 792,492

Claims priority, application Japan, Nov. 1, 1984, 59-230667; Nov. 22, 1984, 59-247416

Int. Cl.[4] A61B *1/12;* **B08B** *9/02*

U.S. Cl. 128—4 **19 Claims**

1. A cleaning apparatus for cleaning channels of an endoscope which comprises an operating section, an insertion section extending from the operating section, a universal cord extending from the operating section, an air channel, a liquid channel and a suction channel extending inside the endoscope, an air/liquid cylinder provided at the operating section and communicating with the air channel and the liquid channel, and a suction cylinder provided at the operating section and communicating with the suction channel, said air/liquid cylinder and said suction cylinder each including an open end portion projecting from the operating section and an engaging portion formed on the open end portion, said apparatus comprising:

liquid feeding means for feeding a detergent solution;

a connector detachably connected to the air/liquid cylinder and the suction cylinder; and

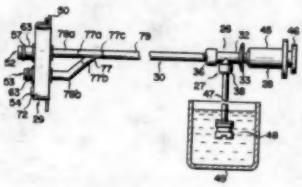
connecting means for connecting the liquid feeding means and the connector to deliver the detergent solution fed from the liquid feeding means into the channels of the endoscope through the connector,

said connector including

a support body,

an air/liquid mouthpiece movably supported by the support body and connected to the open end portion of the air/liquid cylinder in a liquid-tight manner, said air/liquid mouthpiece having a liquid passage communicating with the inside of the air/liquid cylinder and the connecting means and a retaining portion engaging the engaging portion of the air/liquid cylinder,

a suction mouthpiece movably supported by the support body and connected to the open end portion of the suction



cylinder in a liquid-tight manner, said suction mouthpiece having a liquid passage communicating with the inside of the suction cylinder and the connecting means and a retaining portion engaging the engaging portion of the suction cylinder,

a slider slidably supported by the support body and having a first holding portion adapted to engage the engaging portion of the air/liquid cylinder and a second holding portion adapted to engage the engaging portion of the suction cylinder, said slider being movable between a first position where the first and second holding portions of the slider are disengaged from the engaging portions of the cylinders, and a second position where the first holding portion engages the engaging portion of the air/liquid cylinder to hold the engaging portion of the air/liquid cylinder between the first holding portion and the retaining portion of the air/liquid mouthpiece, and where the second holding portion engages the engaging portion of the suction cylinder to hold the engaging portion of the suction cylinder between the second holding portion and the retaining portion of the suction mouthpiece, and

urging means for urging the first and second holding portions toward the respective retaining portions of the air/liquid mouthpiece and the suction mouthpiece when the slider is moved to the second position.

4,637,379

DEVICE FOR IMPARTING CONTINUOUS PASSIVE MOTION TO LEG JOINTS

John H. Saringer, Toronto, Canada, assignor to Toronto Medical Corporation, Scarborough, Canada

Filed Dec. 5, 1984, Ser. No. 678,334

Int. Cl.[4] A61H *1/02, 1/00*

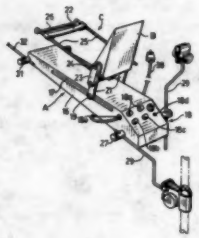
U.S. Cl. 128—25 R **14 Claims**

1. An apparatus for imparting continuous passive motion to

joints of the leg, including an elongated base having a distal end and a proximal end from which a reclining patient's leg is extended to an elevated connection of the foot with a foot rest for receiving the sole of the foot and retaining the foot unweighted with the toes up and heel down, in which,

the foot rest being fixedly connected to a first member which has a lower pivotal connection to travelling means movable relative to the base forming a linkage with the unweighted ankle, knee and hip joints, and an upper pivotal connection axially aligned with the lower pivotal connection to a second member which, in one mode, is fixed relative to the first member and, in another mode, is pivotal relative to the first member,

means for latching the first member to the second member whereby they must move, in one mode, as a unit about the lower pivotal connection only,



a spacing member for retaining the foot rest substantially a given distance from the proximal end, whereby the leg is held extended,

when the second member is free to move relative to the first member in said other mode,

motor means for imparting reciprocal linear movement to the travelling means whereby, when the spacing member is operative to keep the leg extended, the foot rest pivots back and forth in said other mode about the upper pivotal connection to mobilize only the ankle and, when the spacing member is inoperative, and the first and second members locked together, the foot rest pivots back and forth in said one mode about the lower pivotal connection to mobilize only the hip and knee joints,

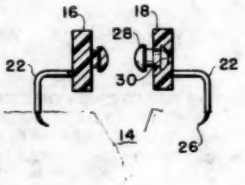
and control means for controlling the motor means to reverse the stroke at given terminal angles of the foot rest to the linear path of travel.

4,637,380

SURGICAL WOUND CLOSURES

Wilmo C. Orejola, 1012 Black Oak Ridge Rd., Wayne, N.J. 07470

Filed Jun. 24, 1985, Ser. No. 748,035
Int. Cl.[4] A61B *17/04, 17/08*
U.S. Cl. 128—334 C **5 Claims**



1. A wound closure comprising:

a pair of skeleton rods, each rod having a substantially planar inner surface, an outer surface opposite said inner surface, and a bottom surface;

a plurality of pins connected to the outer surface of each of said pair of rods, each pin extending outward from said outer surface and downward to a predetermined position below the level of said bottom surface and thence in an inward turning bend toward the wound to terminate in a short sharpened point for engaging the skin of a patient, each pin of said plurality being coated with a plastic coating between its respective skeleton rod and a predetermined position below the level of said bottom surface, said predetermined position forming a stop for limiting the length of insertion of said sharpened pin points; and

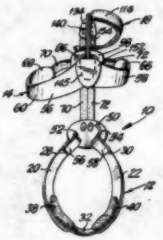
means for interconnecting said planar inner surfaces of said pair of skeleton rods.

4,637,381

FOOT SUPPORTING DEVICE

Gertrude Jungmann, Rangeley, Me., assignor to Institute for Gravitational Strain Pathology, Inc., Rangeley, Me.

Filed Jun. 3, 1985, Ser. No. 740,746
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 G **9 Claims**



1. A foot supporting device for pulling foot muscles back to a relaxation phase intermediate stress phases placed onto the foot muscles, said device comprising:

an instep strap for disposition around a lower instep portion of a foot, said instep strap including an elongated strip of leather;

first and second elastic bands, one end of said first elastic band being secured to one end of said strip, and one end of said second elastic band being secured to an opposite end of said strip;

a connecting member for disposition proximate the ball of the foot, said connecting member receiving said first and second elastic bands to fittingly maintain said strip around the lower instep portion of the foot, said first and second elastic bands passing through said connecting member;

said connecting member including guide means for directing said first and second elastic bands from a footencircling direction stemming from the opposing ends of said strip to a longitudinal direction along a length of a sole portion of the foot towards a heel portion of the foot;

a heel strap for disposition over the heel portion of the foot;

an adjustment member for disposition on the sole portion of the foot, said adjustment member including adjusting means for adjusting tension in said first and second elastic bands to thereby control any pull along the sole portion of the foot between said instep strap and said heel strap;

said adjustment member including a coupling plate to couple said first and second elastic bands to said heel strap, opposing ends of said heel strap being secured to said coupling plate;

said adjusting means including apertures in said coupling plate for receiving opposite ends of said first and second elastic bands with said opposite ends of said first and second elastic bands projecting out from said coupling plate apertures so that pulling said opposite ends of said

first and second elastic bands through said coupling plate apertures provides for adjustment of the tension in said first and second elastic bands; and

a toe strap elastically coupled to said connecting member for disposition around the big toe of the foot.

4,637,382

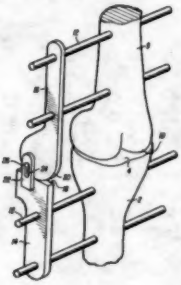
MOTION-GUIDING LOAD-BEARING EXTERNAL LINKAGE FOR THE KNEE

Peter S. Walker, Weston, Mass., assignor to Brigham & Women's Hospital, Boston, Mass.

Continuation of Ser. No. 372,109, Apr. 27, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 642,716

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 Z **10 Claims**



1. A motion guiding, load bearing, external linkage for a knee joint, comprising:

first and second tibial components respectively secured to the lateral and medial sides of the tibia, each said tibial component having a tibial load bearing surface;

first and second femoral components respectively secured to the lateral and medial sides of the femur, each said femoral component having a femoral load bearing surface movably contacting one of said tibial load bearing surfaces; and

first and second link means respectively connected between said first tibial and femoral components and said second tibial and femoral components, wherein said first and second link means comprise, respectively, first means for positively guiding the relative motion of said first tibial and femoral components along a first predetermined path during knee flexure and second means for positively guiding the relative motion of said second tibial and femoral components along a second predetermined path during knee flexure, said second predetermined path being geometrically different from said first predetermined path, and wherein said first and second means for positively guiding said first and second tibial and femoral components collectively comprise means for forcing transverse rotation of the femur about the longitudinal axis of the tibia during knee flexure.

4,637,383

TOXIC ENVIRONMENTAL BREATHING HOOD

Edward L. Lopez, Newhall, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 23, 1985, Ser. No. 812,499

Int. Cl.⁴ A62B *7/00*

U.S. Cl. 128—201.25 **3 Claims**

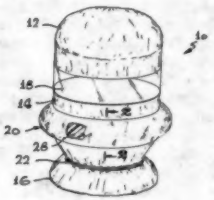
1. A breathing hood assembly for protecting a person from a fire and toxic gases produced, therefrom comprising:

a hood of fire resistant, gas impervious material sufficiently sized so as to fit over the person's head, said hood having a neck portion including means for sealing the hood to the neck of the person, the interior surface of said neck portion lined with a silica gel and barium oxide impregnated cloth;

a transparent window mounted to said hood extending about the periphery thereof; and,

a filter mounted to said hood extending about the periphery thereof, said filter in communication with the interior of said hood, said filter comprising:

an inner sodium bisulfate impregnated cloth layer secured at its edges to and annular opening extending around the periphery of said hood;



an outer fire resistant cloth cover joined at its edges to the edges of said inner cloth layer, said inner and outer cloth layers forming a donut shaped cavity;

a donut shaped cloth bag impregnated with silica gel and barium hydroxide lining said cavity and,

a flexible polyurethane foam filling said cavity, said polyurethane foam impregnated with activated charcoal, micro pumice stone particles coated with caustic soda, and a compound of manganese dioxide and copper oxide.

4,637,384

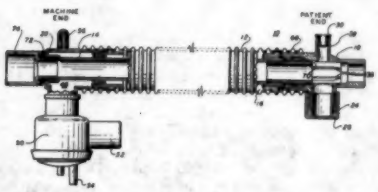
COAXIAL BREATHING CIRCUIT

Gerhardt P. Schroeder, Madison, Wis., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Feb. 15, 1985, Ser. No. 702,561

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—204.18 **5 Claims**



1. A patient breathing circuit for providing gases from a breathing machine to a patient comprising:

a flexible corrugated outer tubing;

a flexible inner tubing generally coaxial with said outer tubing forming a first gas path between said inner and outer tubings, and a second gas path within said inner tubing;

a patient end connector attached to one end of said outer tubing and said inner tubing and forming a path between said first and second gas paths to the patient, said patient end connector comprising a tube end piece having one end secured to said one end of said inner tubing, said end piece including a flexible tab portion which angles radially outwardly and in the direction of said inner tubing, said patient end connector further comprising housing means forming a cylindrical flow chamber, at least three ribs

radially spaced around the inside surface of said cylindrical flow chamber and extending longitudinally of and, generally radially into said chamber, and first and second longitudinally spaced apart stop means in said chamber, said tube end piece being slidably positioned along said ribs within said chamber and spaced therefrom by said ribs, and said tube end piece having an opposite end being engaged with said first stop means to allow limited sliding movement of said end piece within said housing in one direction and said flexible tab portion being engaged with said second stop means to allow limited sliding movement of said end piece within said housing in an opposite direction; and a machine end connector connected to the other ends of said inner and outer tubings, said machine end connector having an outlet for discharging gas from said first gas path, said machine end connector further having an opening of predetermined internal diameter through which said inner tubing at least partially extends; a male connector to provide gas to said second gas path from said machine, said male connector having a portion of predetermined external diameter, said portion being within said inner tubing and extending through said opening to frictionally engage and sandwich said inner tubing between said portion and said opening; said inner tubing thereby being affixed to said male connector solely by means of the engagement through said inner tubing.

4,637,385

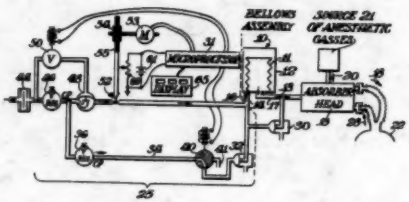
PULMONARY VENTILATOR CONTROLLER

Tibor Rusz, 761 West St., Pittsfield, Mass. 01201

Filed Jan. 13, 1986, Ser. No. 818,005

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.21 **4 Claims**



1.. A pulmonary-bellows-ventilator system for controlling the breathing of an anesthetized and paralyzed patient undergoing surgery, comprising a pulmonary-bellows assembly having a housing, a bellows mounted within said housing forming a chamber therebetween, an inlet on said housing fluidically communicating with said chamber and an outlet means on said housing fluidically communicating with the interior of said bellows and for delivering gas to a patient said bellows having a maximum tidal volume, TV_{max}, a constant-pressure driving-gas source; a switchable valve and an electrically controllable variable throttling valve, said valves connected in series from the output of said source to the input of said bellows assembly, said source and said throttling valve establishing together a maximum flow rate, F_{max}, of said driving gas through said throttling valve; instruction input means for providing target values of the minute volume, MV, of driving gas delivered each minute from said source to said bellows assembly, the frequency, R, at which said switchable valve is opened and closed, the flow rate, F, of driving gas through said throttling valve during periods when said switchable valve is open, and the quantities F_{max} and TV_{max}, microprocessor means having inputs connected to said instruction input means for accepting and storing said target values, said microprocessor means having outputs connected to said switchable valve and said throttling valve, for establishing the actual frequency R, flow rate F and inspiration time I that corresponds to the time period during which said switchable valve is open, for determining the actual tidal volume TV and the ratio E/I of switchable-valve closed-time to open-time according to the relationships:

$$TV = MV/R \text{ and}$$

$$\frac{E}{I} = \frac{F}{MV} - 1,$$

and when said target value MV_T is larger than that MV value which corresponds to the combination of said target value for R and said maximum bellows tidal volume TV_{max}, for changing said actual frequency R away from said target value R to a frequency R_A corresponding to the combination of said TV_{max}, and said MV target value, so that said target MV value is still actually realized according to

$$R_A = \frac{MV_T}{TV_{max}}.$$

4,637,386

VENTILATION SYSTEM HAVING TRUE VALVE CONTROL FOR CONTROLLING VENTILATION PRESSURES

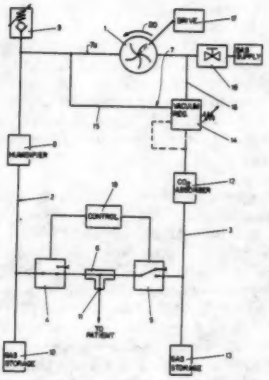
Marcel Baum, Vienna, Austria, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,608

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422066

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.21 **7 Claims**



1. A ventilation system for a person, comprising a ring line having an inlet portion, an outlet portion and a bypass portion connected between said inlet and outlet portions, blower means connected between said inlet and outlet portions for blowing gas from said inlet portion to said outlet portion, drive means connected to said blower means for driving said blower means in only one direction for supplying gas from said inlet portion to said outlet portion, an inspiration line connected to said outlet portion of said ring line for receiving gas therefrom, an inhalation valve connected to said inspiration line, an expiration line connected to said inlet portion of said ring line for supplying gas thereto, an exhalation valve connected to said expiration line, a patient connected between said inhalation and exhalation valves and adapted for connection to a person, and control means connected to said inhalation and exhalation valves for alternately opening said inhalation and exhalation valves to establish inhalation and exhalation for a patient con-

nected to said patient connection and wherein said control means comprises a first housing having an input space connected to said inspiration line, a first valve seat in said input space connected between said inspiration line and said input space, said first housing defining a first control space, a first diaphragm inside first housing separating said first control space from said input space and engageable against said first valve seat for closing communication between said inspiration line and said input space, a second housing having an output space connected to said expiration line, a second valve seat in said output space connected between said output space and said expiration line, said second housing defining a second control space, a second diaphragm in said second housing separating said second control space from said output space and engagable against said second valve seat for closing communication between said output space and said expiration line, a compressed gas source, first and second branch lines connected to said gas source, first ejector nozzle means connected to said first housing for directing a jet stream in a direction to reduce pressure in said first control space to move said first diaphragm in a direction opposite to said first valve seat, second ejector nozzle means connected to said second housing for directing a jet stream in a direction for reducing pressure in said second control space to move said second diaphragm in a direction opposite to said second valve seat, and first injector nozzle means connected to said second housing for directing a jet stream in a direction for increasing pressure in said second control space to move said second diaphragm in a direction toward said second valve seat, and second injector nozzle means connected to said first housing for directing a jet stream in a direction for increasing pressure in said first control space to move said first diaphragm in a direction toward said first valve seat, said first ejector nozzle means and said first injector nozzle means being connected to said first branch line for the simultaneous application of compressed gas thereto, said second injector nozzle means and said second ejector nozzle means being connected to said second branch line for the simultaneous application of compressed gas thereto, the control means including valve means for applying compressed gas alternately to said first and second branch lines, said diaphragms and valve seats forming said inhalation and exhalation valves, and said patient connection being connected between said input space and said second valve seat.

4,637,387

BREATHING APPARATUS

Lester B. Hall, 249 Kinsey Ave., Kenmore, N.Y. 14217

Continuation-in-part of Ser. No. 404,059, Aug. 2, 1982, Pat. No. 4,573,463. This application May 27, 1983, Ser. No. 498,932

Int. Cl.[4] A62B *9/00, 18/02*

U.S. Cl. 128—205.24 **12 Claims**

1. Breathing apparatus comprising:

(a) a body in the form of a mask adapted to be worn over a user's nose and mouth and defining a breathing chamber adapted to be in fluid communication with only the nose, said body having an inlet in fluid communication with said chamber;

(b) a container holding a quantity of gas for breathing and having an outlet, valve means connected to said outlet for opening and closing thereof, and a movable control means connected to said valve means for opening the same in response to movement of said control means, said container having means adjacent said outlet for direct connection to said body with said container outlet in fluid communication with said body inlet, said movable valve control means adjacent said body inlet and said container adjacent to and supported exclusively by said body, said container releasing a quantity of gas to said chamber and thereby to only the nose of the user in response to opening of said valve means by said control means;

(c) operator means carried by said body for operative connection to said valve control means and for operative association with the mouth of the user for moving said valve control means in response to manipulation by the mouth of the user, said operator means comprising an elongated housing fixed to said direct connection means at one end near said body inlet and having an opposite end spaced from said one end and extending into said body adapted for sealing engagement with the user's mouth when the body is in place, said housing having a longitudinal passage therethrough, and an elongated operator body slidably supported within and extending along the passageway within said housing and into said direct connection means, said body being connected at one end to said valve control means and having an opposite end spaced from said one end and adapted for manipulation by the user's mouth whereby the user moves said operator element along the passageway within said housing by manipulating said opposite end with his mouth; (d) exhalation valve means in said body in fluid communication with said breathing chamber for exhausting from said chamber to the atmosphere in response to exhalation by the user; and

(e) means for holding said body on the face of the user;

(f) whereby the delivery of breathing gas from said container to said breathing chamber is controlled by the user manipulating said operator means with his mouth and inhalation and exhalation is performed by the user through his nose from and to said breathing chamber.

4,637,388

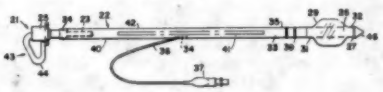
TRACHEAL TUBE OBTURATOR WITH REVERSIBLE TIP

Clifford P. Melendy, North Andover, Mass., assignor to Portex, Inc., Wilmington, Mass.

Filed Oct. 15, 1984, Ser. No. 661,093

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.14 **6 Claims**



1. A tracheal tube assembly comprising:

a tracheal tube having a proximal end, an elongated bore of uniform diameter, and a distal end, said distal end terminating in an opening with an annular rim of predetermined outer diameter; and

an obturator normally sleeved within the bore of said tube, but withdrawable therefrom, said obturator having a proximal end forming a handle, an elongated shank and a distal end with a soft, flexible, conical tip, mounting thereon and normally projecting from said tube opening and having an outer diameter at least equal to the outer

diameter of said rim to shield, and cover the same during insertion of said assembly between the vocal cords;

said soft tip being of resilient deformable material so as to be withdrawable through the bore of said tube with said obturator;

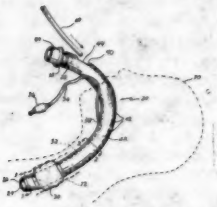
said soft, flexible conical tip includes a blunt rounded leading apex of predetermined length and an integral trailing hollow skirt, of truncated conical configuration, said skirt being substantially equal in length to said apex and invertible toward said apex upon withdrawing of said obturator through said bore to reduce the diameter of said tip.

4,637,389

TUBULAR DEVICE FOR INTUBATION

Eugene L. Heyden, S. 627 Bernard #8, Spokane, Wash. 99204

Filed Apr. 8, 1985, Ser. No. 721,168
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.15 **30 Claims**



1. A tubular device for intubation of a body pathway, comprising:

an elongated tubular member of resilient material providing a wall with an inner wall surface and an outer wall surface, having a forward segment and end for residing within a body pathway, and also having a rearward segment and end for residing outside a body pathway, said tubular member defining a central axis and a central fluid passage extending therethrough;

an elongated guide means provided by said tubular member adapted and longitudinally sufficient for slidably receiving a suction catheter and guiding the same along a substantial length of said tubular member directionally away from the vicinity of said rearward end toward said forward end, said guide means defined within the wall of said tubular member between said inner wall and said outer wall surfaces for defining a region therein for the accommodation of said suction catheter, said guide means further adapted to modify in configuration from a normally unexpanded attitude to an expanded attitude when accommodating said suction catheter; and

fluid communication means for providing fluid communication between the region within said guide means and said body pathway, said fluid communication means provided by the wall of said tubular member and residing in locations adjacent said guide means between said forward and said rearward ends, said fluid communication means also residing in a plurality of locations along the wall of said tubular member adjacent a plurality of locations within said guide means for providing fluid communication over a substantial length of said guide means between said region and said body pathway, whereby said suction catheter can remove secretions over any of several locations along said tubular member when moved at various depths within said guide means.

4,637,390

ELECTROSURGICAL INSTRUMENT

Oleg A. Sorochenko, Kharkov, U.S.S.R., assignor to Nauchno-Issledovatelsky Institut Obschei i Neotlozhno Khirurgii, Kharkov, U.S.S.R.

PCT No. PCT/SU83/00042, § 371 Date Jul. 30, 1985, § 102(e) Date Jul. 30, 1985, PCT Pub. No. WO85/02335, PCT Pub. Date Jun. 6, 1985
PCT Filed Dec. 1, 1983, Ser. No. 769,987
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.14 **2 Claims**

1. An electrosurgical instrument comprising:

a first active electrode in the form of a disk cutter;

a second active electrode identical to said first electrode disposed coaxially with said first electrode;

a gap formed between said two electrodes;

a disk of an insulating material having a diameter smaller than the diameters of said electrodes, said disk being located in said gap and being mounted coaxially with said electrodes;

cutting edges of said disk cutters having toothed portions and toothless portions alternating regularly and having an identical length;

said electrodes being so positioned relative to each other so that said toothed portions of one of said electrodes are disposed opposite said toothless portions of the other of said electrodes;

current leads electrically connected to said electrodes for supplying diathermic current to said electrodes; and

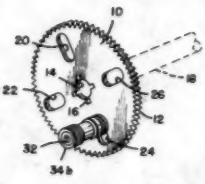
drive means for rotating said cutting edges around an axis passing through the centers of said electrodes.

4,637,391

SURGICAL SAW BLADE

Allen P. Schlein, 107 Curtis Ter., Fairfield, Conn. 06432

Filed Apr. 3, 1986, Ser. No. 847,693
Int. Cl.[4] A61F *15/02*
U.S. Cl. 128—317 **9 Claims**



1. A surgical saw blade for attachment to a power operated oscillatory surgical saw comprising:

a blade portion having teeth disposed along at least a portion

of an outer periphery of same and defining an arcuate cutting surface thereat, said blade portion having a central saw connector-receiving opening therethrough for securement of said blade to said saw, and also having an elongated slot therethrough disposed with its long axis on a radius of said blade portion extending between said central opening and the arcuate cutting surface of said blade portion, and

a cutting depth stop including a cylindrical metal sleeve surrounding a hollow cylindrical inner sleeve formed of thermal insulating plastics material and extending outwardly from one side of said blade in a direction perpendicular to the plane of said portion and releasably secured at a desired adjusted position along said elongated slot by a bolt extending through said slot from the other side of said blade portion and threadably engaging said cylindrical inner sleeve, the length of said metal sleeve being sufficient to preclude ingress of said cutting teeth beyond a depth defined by the distance between said cutting teeth and a surface of said metal sleeve closest said teeth.

4,637,392

BIPOLAR ELECTROCOAGULATOR

Oleg A. Sorochenko, Kharkov, U.S.S.R., assignor to Kharkovsky Nauchno-Issledovatelsky Institut Obschei i Neotlozhnoi Khirurgii, Kharkov, U.S.S.R.

Filed Aug. 19, 1985, Ser. No. 773,006

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.13 **15 Claims**

11. The bipolar electric coagulator according to claim **1**, wherein the shape of said working body of revolution is in the form of an ellipsoid.

4,637,393

SURGICAL INSTRUMENT

Andrew I. A. Ray, Chipperfield, United Kingdom, assignor to Microsurgical Equipment Limited, United Kingdom

Filed Jun. 21, 1984, Ser. No. 623,194

Claims priority, application United Kingdom, Jun. 21, 1983, 8316824

Int. Cl.[4] A61F *17/32*

U.S. Cl. 128—305 **8 Claims**

1. A surgical instrument for causing a member to penetrate into an organ or body part to a depth which is within a desired distance from a remote face of the organ or body part, the instrument comprising

a said member,

a housing for housing said member,

drive means for driving said member with respect to and so as to extend from said housing,

sensing means mounted on the housing for sensing the thickness of the organ or body part in the vicinity of such penetration and arranged to produce a first output signal, said first output signal representing said thickness,

setting means settable to a level indicative of said desired distance and arranged to produce a second output signal, said second output signal representing said desired distance,

comparator means arranged and connected to compare said output signals and to produce a comparison signal repre-

senting any difference between said thickness and said desired distance, and

means responsive to said comparison signal to cause said drive means to drive said member to extend from said housing into a said organ or body part to a depth which is said desired distance from said remote face.

4,637,394

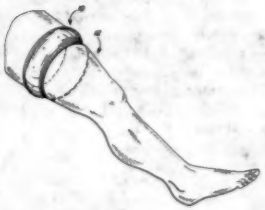
CONSTANT PRESSURE TOURNIQUET

Gabor B. Racz, 4504 17th St., Lubbock, Tex. 79416, and Royce C. Lewis, 5233 19th St., Lubbock, Tex. 79407

Filed Jun. 11, 1985, Ser. No. 743,566

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—327 **18 Claims**



1. A constant pressure tourniquet of a size to be removably received about a person's limb; said tourniquet includes spaced wall surfaces made of an elastomeric material; said wall surfaces form an inflation chamber therewithin;

said elastomeric material of at least one wall surface has a thickness and modulus of elasticity that exhibits a threshold pressure which is slightly greater than the blood pressure of the vessels of the limb to which the tourniquet may be attached; whereby, inflation of the tourniquet to a volume greater than the volume attained at the threshold pressure of the elastomeric material causes the tourniquet to apply a substantially constant pressure to the limb and thereby arrest flow of blood from a wound that may be associated with the limb.

4,637,395

APPLICATOR FOR C-SHAPED SCALP CLIPS

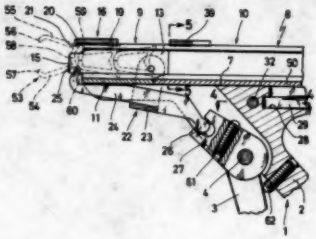
Wolfhard Caspar, Bad Homburg; Theodor Lutze, Balgheim, and Karl-Ernst Kienzle, Immendingen, all of Fed. Rep. of Germany, assignors to Aesculap-Werke AG, Tuttlingen, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 657,269

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3335986; Feb. 15, 1984, 3405335

Int. Cl.[4] A61B *17/00, 17/04, 17/12*

U.S. Cl. 128—334 R 18 Claims



1. An applicator for C-shaped scalp clips which have two legs joined by a bridge and facing clamping jaws at their free ends, rearwardly projecting application surfaces at the regions where the legs and bridge meet, and laterally projecting edge regions adjoining the application surfaces, comprising

two applying instruments movable between first and second positions and positioned to engage the application surfaces of a scalp clip and displace them towards one another for opening said scalp clip when said applying instruments are in said second position,

a magazine that holds a plurality of the scalp clips arranged one behind the other, with the free ends of one scalp clip resting against the bridge of the adjacent scalp clip, said magazine being open at the end to which the free ends of the legs of the scalp clips point, and guiding the scalp clips for displacement in the longitudinal direction thereof, and

means for urging the scalp clips towards the open end of the magazine,

said applying instruments in the first position being remote from one another, projecting downwardly and upwardly into the feed path of the scalp clips at said open end such that one of said scalp clips moved by said urging means past said applying instruments abuts thereon with said laterally projecting edge regions adjoining the application surfaces and in the second position being closer together with said instruments abutting on the application surfaces of one of said scalp clips held between them and thereby opening said one scalp clip.

4,637,396

BALLOON CATHETER

William A. Cook, Bloomington, Ind., assignor to Cook, Incorporated, Bloomington, Ind.

Filed Oct. 26, 1984, Ser. No. 665,374

Int. Cl.[4] A61M *29/02*

U.S. Cl. 128—344 15 Claims

1. A balloon catheter, comprising:

a hollow flexible catheter tube;

a flexible inner member disposed coaxially within said catheter tube and fixed thereto against relative longitudinal displacement, the distal end of said inner member extending beyond the distal end of said catheter tube, said inner member being sized and configured to provide a longitudinal passageway between said inner member and said catheter tube for the passage of fluid therethrough;

connecting means for connecting the longitudinal passageway to an external source of pressurized fluid; and

a balloon disposed coaxially about said inner member, the proximal end of said balloon being fixed and sealed to the distal end of said catheter tube and the distal end of said balloon being fixed and sealed to the distal end of said inner member to define an annular balloon chamber, said annular balloon chamber being in fluid flow communication with the longitudinal passageway, said balloon including an impervious elastic wall for retaining pressure therein, said elastic wall being reinforced by a knitted fabric tube for permitting said balloon to expand to a predetermined maximum diameter while remaining fixed in length.

4,637,397

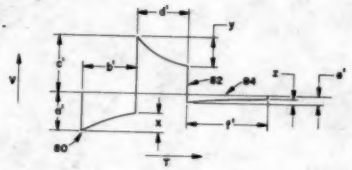
TRIPHASIC WAVE DEFIBRILLATION

Janice L. Jones, and Ronald E. Jones, both of Solon, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed May 30, 1985, Ser. No. 739,133

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D 16 Claims



1. A method for electrical defibrillation of fibrillating myocardial tissues comprising the steps of:

(a) defining a defibrillating pulse with a defibrillating polarity, a defibrillating voltage, and a defibrillating pulse width between three and fifteen milliseconds in duration;

(b) defining a conditioning pulse with a polarity opposite to the defibrillating polarity, a conditioning pulse voltage level between 20% and 200% of the defibrillating voltage, and a conditioning pulse width between three and fifty milliseconds in duration;

(c) defining a healing pulse with the opposite polarity as the defibrillating polarity, a healing pulse voltage level between 5% and 40% of the defibrillating voltage, and a healing pulse width between one and one-hundred milliseconds in duration; and,

(d) applying the conditioning pulse, the defibrillating pulse, and the healing pulse in sequence to cells in said fabrillating myocardial tissues.

4,637,398

MASTECTOMY BRASSIERE

Janice K. Sherwood, 2 Grove Isle Dr., Coconut Grove, Fla. 33133

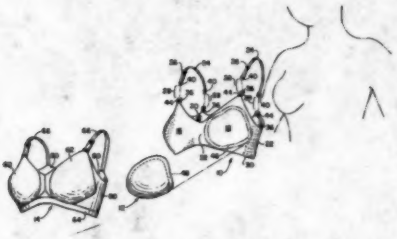
Filed Oct. 11, 1985, Ser. No. 786,668

Int. Cl.[4] A41C *3/10*

U.S. Cl. 128—478 9 Claims

1. A singular prosthetic brassiere garment compensating for the loss of a woman's breast consisting of the combination of a separate underbra, a breast prosthesis and an outerbra, the underbra having a band portion to enclose the torso and a supporting cup for the normal breast of the wearer when the wearer has a remaining breast, and a flat portion fitting flat against the chest wall from which a breast has been removed, said prosthesis comprising, a prosthesis pad formed of a desired

shape simulating the removed breast and removably adhered to the outer surface of said underbra, said outerbra comprising a conventional brassiere having a pair of breast supporting cups, one of said underbra and outerbra having adjustable strap means, the other of said underbra and outerbra having strap



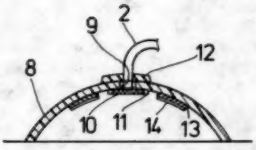
means joined with said adjustable strap means whereby said underbra, prosthetic pad, and outerbra are joined together to form a unitary garment in which said bras are adjustable to be retained fitting against the chest wall of a removed breast and against separation therefrom and to provide the function and produce the appearance of a singular brassiere.

4,637,399

WATERPROOF ELECTRODE FOR RECORDING ELECTROCARDIOGRAM

Toshio Asai, Uchisadamachi, and Yasuhiro Nakaya, Kanazawa-shi, both of Japan, assignors to Fukuda Denshi Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 742,822
Claims priority, application Japan, Jun. 11, 1984, 59-120379
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 **1 Claim**



1. A waterproof electrode for detecting an electrocardiac signal comprising:

(a) a cup-shaped suction disc constructed from a waterproof, elastic material, said disc having a concave side, a convex side and a through-hole at the center thereof;

(b) an electrode plate having an outer peripheral edge hermetically sealed to the concave surface of said suction disc and closing said through-hole;

(c) a lead wire connecting to said electrode plate and extending through said through-hole and past the convex surface of said suction disc;

(d) elastic sealing means for hermetically sealing together the outer peripheral edge of said electrode plate and the portions of the concave surface of said suction disc in contact with said peripheral edge of said electrode plate;

(e) elastic sealing means hermetically sealing the lead wire at the convex surface of the suction disc; and,

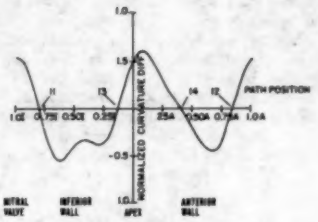
(f) an annular, body-surface adherent strip surrounding said electrode plate and bonded to said concave side of said disc.

4,637,400

FOR CHARACTERIZING A HEART CONDITION

Edward N. Marcus, 49 Fiske Rd., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 702,131, Feb. 15, 1985, abandoned. This application Aug. 13, 1985, Ser. No. 765,373
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—653 **2 Claims**



1. A method of characterizing the condition of a heart which method includes the steps of,

medically imaging said heart to obtain the outline of the end diastole image as a first curve and the end systole outline image as a second curve,

determining the normalized curvature of a sequence of points along each of said curves over a predetermined pathlength as a function of the normalized distance of a respective point along said pathlength,

determining for each of said points the functional relationship of said normalized curvature to the normalized distance of the associated point along said pathlength to obtain first normalized curvature values of said first curve and second normalized curvature values of said second curve,

and differentially combining said first normalized curvature values and said second normalized curvature values at corresponding values of position along said pathlengths to provide a difference functional relationship representative of the difference in shape between said first and second curves,

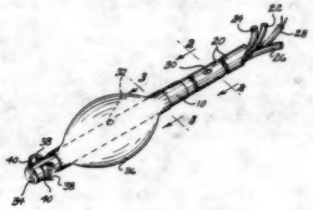
said curves each defining a closed loop and each pathlength corresponding to a segment of a respective closed loop beginning and ending at predetermined reference points on said closed loops.

4,637,401

VOLUMETRIC FLOW RATE DETERMINATION IN CONDUITS NOT DIRECTLY ACCESSIBLE

G. Gilbert Johnston, 417 S. 289th, Federal Way, Wash. 98003

Filed Nov. 1, 1984, Ser. No. 667,333
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—663 **11 Claims**



1. A catheter for use within an intravascular conduit, said catheter comprising:

an elongated tube having a proximal portion of substantially flexible material and having a distal portion;

flow restriction means carried by said distal portion of said tube, said flow restriction means being selectively controllable between a first state in which said flow restriction means does not substantially restrict flow through a reference plane transverse to the longitudinal axis of such distal portion when said catheter is in use in a location substantially fixed with respect to said reference plane and a second state in which said flow restriction means does substantially restrict flow through said reference plane when said catheter is in said location; and

ultrasonic transducer means carried by said distal portion proximate said flow restriction means, said ultrasonic transducer means being constructed and arranged so as to transmit and receive ultrasonic energy along a beam axis that intersects said reference plane at points always external to said flow restriction means.

4,637,402

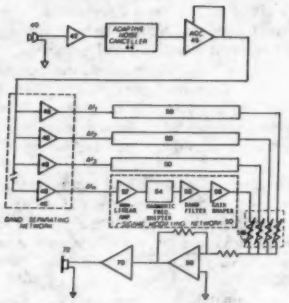
METHOD FOR QUANTITATIVELY MEASURING A HEARING DEFECT

Roger A. Adelman, 1562 Wittlou Pl., Cincinnati, Ohio 45224

Division of Ser. No. 371,584, Apr. 26, 1982, Pat. No. 4,419,544, which is a division of Ser. No. 144,395, Apr. 28, 1980, Pat. No. 4,366,349. This application Dec. 1, 1983, Ser. No. 556,894

Int. Cl.[4] A61B 5/12

U.S. Cl. 128—746 **3 Claims**



1. A method of providing a quantitative measure of a hearing defect of a patient in relationship to generalized signal processing parameters, comprising the steps of:

(a) determining and recording frequency bands to which the patient's auditory system responds at a predetermined level and frequency bands to which the patient's auditory system is unable to respond at the predetermined level through the agency of a swept frequency tone generator operated at incremental intensity levels;

(b) providing a number of frequency band limited signal processing paths in accordance with said determining and recording step, the processing paths being operative to generate a signal responsive to those frequency bands to which the patient's auditory system responds at the predetermined level;

(c) adjusting and recording the parameters necessary to shift in a harmonic sustaining manner the frequency bands in which the patient's auditory system does not respond to frequency bands in which the patient's auditory system does respond; and

(d) adjusting and recording within each frequency band processing path and in the aggregrate of all said frequency band processing paths at least such parameters as are necessary to shape, linearly or nonlinearly amplify, amplitude compress, and adaptively filter background noise from the signals generated by the processing paths in a continuously variable and adaptively fashion so as to produce an aurally recognizable signal to the patient.

4,637,403

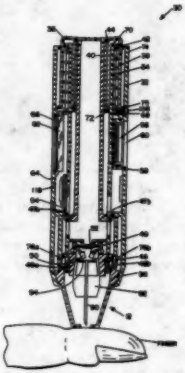
GLUCOSE MEDICAL MONITORING SYSTEM

Fernando S. Garcia; Hartmut Ginnow-Merkert; Paul J. Anderson, and Bertram J. Hudson, all of Eden Prairie, Minn., assignors to Garid, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 720,906, Apr. 8, 1985. This application Jun. 14, 1985, Ser. No. 744,539

Int. Cl.[4] A61B 17/3

U.S. Cl. 128—770 **7 Claims**



1. Hand-held pocketable measurement system for extraction and analysis of blood in a body, comprising:

pocketable housing member including a spring actuated hammer means in said housing member, optical measurement means including a light source and a light sensor for measuring light emanating from said source and reflected by blood reagent chemistry having a color optical characteristic proportional to the component of the liquid to be measured when in contact with the liquid, said optical measurement means generating an electrical signal responsive to a color change of said blood reagent chemistry and therefore also to the component to be measured, display means responsive to said electrical signal to provide a visual readout representative of the analysis on a display means in said housing member, and channel means for removably receiving a disposable diagnostic unit; and,

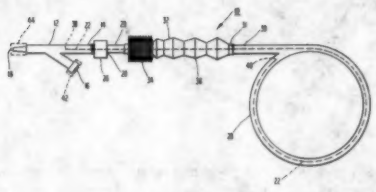
b. disposable diagnostic unit including a unit housing with opposing tabs for slidably and removably engaging said channel means, means supporting said blood reagent chemistry in said unit housing in a position to be sensed by said optical measurement means when said unit housing is engaged within said channel means, said blood reagent chemistry having said color optical characteristics responsive to the component of the liquid to be measured, spring mounted lance means in said unit housing and positioned to be struck by said hammer means, a hole in said unit housing below said lance means, said lance means moving when struck to pierce the body to allow fluid to flow therefrom, and wick means between said lance means and said blood reagent chemistry means for transporting said fluid flowing from within the body to said reagent means, thereby resulting in a color change yielding a responsive optical characteristic which is read by said optical measurement means.

4,637,404

METHOD AND APPARATUS FOR CONVERTING A CATHETER TO A CARDIAC PACING ELECTRODE

Lawrence J. Gessman, 1929 West Point Ct., Cherry Hill, N.J. 08002

Filed Oct. 20, 1983, Ser. No. 543,866
Int. Cl.[4] A61N 1/05
U.S. Cl. 128—786 16 Claims



1. An apparatus for converting an in-place cardiac catheter to a pacing electrode, said catheter having at least one distal port at one end threof and at least one proximal port at the other end with a lumen connected therebetween, said distal port being positioned within a pre-selected heart chamber, said apparatus comprising:

a. a wire electrode comprising a length of electrically conductive wire having a proximal end adapted for electrical connection to a pacemaker pulse generator and a distal end;

b. a cannular connector having a first port containing adjustable sealing means adapted to receive and adjustable to a first position to permit said wire electrode therethrough and a second position to substantially prevent fluid transmission through said first port, and at least a second port adapted to matingly engage the proximal port of said catheter; and

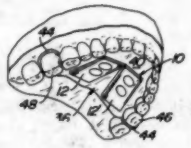
c. means for advancing said wire electrode through said adjustable sealing means, said cannular connector, said second port and said lumen, until the distal end of said wire electrode emerges from the distal port of said catheter and engages a surface of said heart chamber.

4,637,405

APPARATUS FOR STIMULATING SALIVATION

Henry S. Brenman, Cinnaminson; Philip Katz, Princeton Junction, both of N.J., and Graydon E. Beatty, Philadelphia, Pa., assignors to Biosonics, Inc., Philadelphia, Pa.

Division of Ser. No. 481,331, Apr. 1, 1983, Pat. No. 4,519,400.
This application Oct. 17, 1984, Ser. No. 661,667
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—787 12 Claims



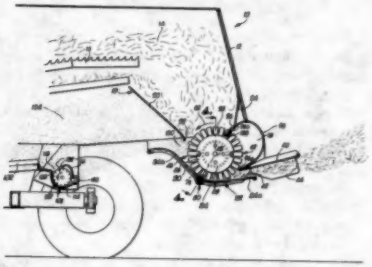
1. Apparatus for inducing salivation by neural stimulation at neurally sensitive areas within the oral cavity of a user, comprising a housing adapted to be received within the oral cavity of a user, said housing having an enclosure therein, an electrical signal generator disposed in said enclosure, said signal generator including a power supply, at least one electrode operatively associated with said housing and electrically coupled to said signal generator, said electrode being so positioned with respect to said housing as to be juxtaposed to and in operative contact with a neurally sensitive area of the oral cavity, the stimulation of which by electrical energy can induce salivation, when said housing is operatively disposed, whereby said electrode applies a signal generated by said signal generator to the sensitive area to induce salivation.

4,637,406

CHAFF AND STRAW SPREADING ATTACHMENT FOR COMBINES

Ronald K. Guinn, Valley Center, and Ferol S. Fell, Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 9, 1984, Ser. No. 639,251
Int. Cl.[4] A01F 29/02
U.S. Cl. 130—27 R 10 Claims



1. In combination with an agricultural combine having a rearmost discharge for straw residue and a separate forwardly positioned discharge for chaff, apparatus for joining the discharged straw and chaff into a single stream and spreading the same behind the combine as the latter advances across a field, said apparatus comprising:

a housing attached to said straw discharge and having an internal chamber,

said chamber being provided with a straw inlet and an outlet at opposite portions thereof;

a rotor located within said chamber between said inlet and outlet having an axis of rotation transverse to the path of travel of materials therethrough,

said rotor having means thereon capable of impacting materials passing through the rotor during rotation of the latter and of creating a stream of air flowing through the chamber and out said outlet to entrain materials therein,

said housing being provided with a second inlet to said chamber adjacent said straw inlet and remote from said outlet for receiving chaff from said chaff discharge and directing the same into said chamber for admixture with the straw, movement through the rotor, and entrainment in the stream flowing out said outlet;

spreader means associated with said outlet in disposition for impinging the entrained materials issuing from said housing and dispersing the same laterally behind the advancing combine;

a booster impeller adjacent said chaff discharge for producing a chaff-entraining current of air flowing to said chaff inlet of the rotor housing;

an impeller housing about said impeller and provided with an outlet spaced from and oriented toward said chaff inlet of the rotor housing whereby to direct the air current to the rotor housing; and

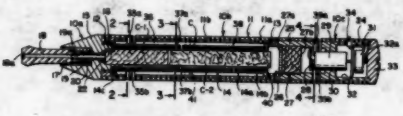
an open transfer space defined between the outlet of the impeller housing and the chaff inlet of the rotor housing,

said open transfer space being exposed to the chaff discharge and said outlet of the impeller housing being physically separate from and unattached to the chaff inlet of the rotor housing whereby the air current moving through said transfer space and exposed to the chaff discharge may entrain the chaff and carry the same into the rotor housing.

4,637,407
CIGARETTE HOLDER

Mario Bonanno, Whiting, N.J.; George Zinonos, Astoria, and Constantin Trantzas, Jackson Heights, both of N.Y., assignors to Cangro Industries, Inc., Farmingdale, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,650
Int. Cl.[4] A24F *7/04*
U.S. Cl. 131—175 5 Claims



1. A fire-safe environmentally protective cigarette holder for discharging only filtered smoke to the environment both when the smoker is drawing and when the cigarette is free burning, comprising

a closed casing for containing at least the burnable body portion of the cigarette;

an air inlet port in the casing;

duct means to direct fresh air from the inlet port to the burnable body portion of the cigarette;

motor driven impeller means to move the air from the inlet port to the burnable body to maintain combustion when the smoker is not drawing;

a discharge port for the products of combustion and filter means in the path of discharge,

whereby the impeller means and the smoker when drawing provide parallel impelling forces for the airflow from the inlet port to the burnable body.

4,637,408
FILTER MATERIAL FOR THE REMOVAL OF NITRIC OXIDE

Norman B. Rainer, Richmond, and Charles S. McClung, Prince George, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,365
Int. Cl.[4] A24D *3/06*; B01D *46/02*
U.S. Cl. 131—331 14 Claims

1. A composition for NO filtration, comprising, by weight of the total composition, from about 5% to about 40% of a permanganate selected from the group consisting of $NaMnO_4$, $Ca(MnO_4)_2$ and mixtures thereof, from about 0.5% to about 6% colloidal silica, from about 40% to about 90% silica gel and from about 4% to about 30% H_2O, said silica gel having a granule size of from about 20 to about 100 mesh and an initial pore volume of from about 0.6 cc/g to about 1.4 cc/g.

7. A cigarette filter for NO filtration, comprising a plug-space-plug filter wherein the space between the plugs contains the composition of claim 1.

4,637,409
TOBACCO SMOKE FILTER AND METHOD AND APPARATUS FOR MAKING SAME

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

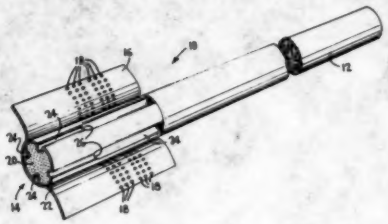
Filed May 7, 1981, Ser. No. 261,690
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 39 Claims

1. A smoke filter including a filter element comprising:

a smoke-pervious filter rod having first and second longitudinally-spaced ends;

smoke-impervious rod wrap means wrapped about said filter rod, said rod wrap means being recessed into said filter rod to define at least one continuous grooved portion of said rod wrap means extending from said first end to said second end wherein said grooved portion has a transverse cross-sectional area which varies as a function of the longitudinal displacement from said first end of said filter rod; and

tipping means disposed about said rod wrap means to cover

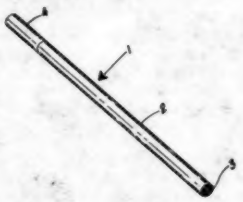


said grooved portion, said tipping means being made of material which is impervious to smoke, said tipping means including ventilation means for providing gas flow communication between said grooved portion and ambient air.

4,637,410
CIGARETTES

John A. Luke, Eastleigh, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 22, 1985, Ser. No. 757,406
Claims priority, application United Kingdom, May 24, 1985, 8513233
Int. Cl.[4] A24D *1/00*
U.S. Cl. 131—361 5 Claims



1. A cigarette comprising a tobacco rod which rod comprises a tobacco filler and a paper wrapper, the circumference of said rod being within a range of 10 mm to 19 mm, and having a tobacco filler packing density within the range of 150 mg per cm^3 to 350 mg per cm^3 yielding a free burn rate of said rod within a range of 25 to 45 mg min^{-1}.

4,637,411
HAIRDRESSER'S AID

Bernard Sanders, St. Peter, Channel Islands, assignor to Raynham Investments Limited, Jersey, Channel Islands

Filed Apr. 6, 1984, Ser. No. 597,596
Claims priority, application United Kingdom, Apr. 11, 1983, 8309719
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—9 2 Claims

1. A disposable hairdresser's masking sheet of flexible material for insulating selected strands of a head of hair from other strands of the hair while selected strands are subjected to a colouring agent, said sheet comprising a substrate of flexible material configured as two adjacent portions having a common boundary defined by a hinge about which one of said adjacent portions is pivotable relative to the other so as to encapsulate

said selected strands and securing means carried by said substrate and adapted to engage said selected strands, whereby

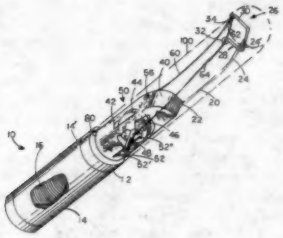
application of the securing means to said selected strands removably unites said sheet with said selected strands.

4,637,412

DEVICE FOR STORING DENTAL FLOSS AND FOR FORMING THREE SEPARATELY-USABLE STRIPS OF FLOSS FOR USE WITH TENSIONING MEANS

Armando Martinez, 4749 Hackett Ave., Lakewood, Calif. 90713

Filed Jun. 27, 1985, Ser. No. 749,517
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—92 R **5 Claims**



1. A dental flossing device for storing a spool of floss and allowing the use thereof in a ready and continually adjustable manner, comprising:

a main body portion having a hollow interior thereof for storing a spool of dental floss for paying out the dental floss;

elongated floss guide means having a first end toward said main body portion, and a second end remote therefrom and projecting away from said main body portion so as to define a length by which the dental floss may be extended, said second end of said guide means comprising a first threading and retaining means for a portion of the dental floss, and a second threading and retaining means for another portion of the dental floss, whereby dental floss from the spool may be extended from said main body portion along said guide means and through said first and second threading and retaining means;

means for continually tensioning the dental floss, said means for tensioning comprising a rotatably mounted wheel means, housing means for said wheels means for mounting said wheel means to said main body portion, and a shaft mounted for rotation with said wheel means, said shaft passing through the center of said wheel means such that said wheel means is rotatable in a plane perpendicular to the length of said shaft; said shaft having a first end projecting outwardly of a side surface of said housing having a first groove formed therein, and a second end projecting from another side surface of said housing having a second groove formed therein;

means for conjointly connecting said wheel means and said shaft so that when said wheel means is rotated, said shaft is rotated in unison therewith;

means formed in said side surfaces of said housing for allowing disassembly of said wheel means and said shaft from said housing for cleaning and replacement of parts and for rotatably mounting said first and second ends of said shaft;

means for limiting the rotation of said wheel means and said shaft to only one direction and preventing the rotation thereof in the other direction; and

said housing having a receptacle thereof for mounting therein said wheel means, said wheel means having a circumferential portion of said wheel means projecting beyond said housing to allow access thereto of a finger for rotating said wheel means; wherein the detal floss from the spool may be inserted through said first groove before threading in said first and second threading and retaining means, and inserted through said second groove after threading in said first and second threading and retaining means, said plane of rotation of said wheel means being parallel to the direction from said first end of said guide means toward said second end of said guide means.

5. In a mounting arrangement for mounting a wheel, and the like, via shaft in a housing so as to allow for conjoint rotation of the shaft and wheel and easy disassembly thereof from the housing and from each other, the improvement comprising:

said wheel having a central opening of noncircular shape through which extends said shaft;

said shaft having an enlarged center portion of the same shape as said central opening of said wheel;

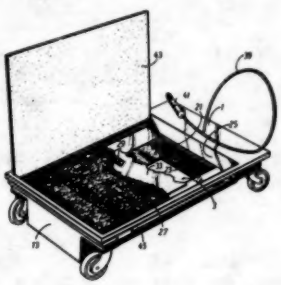
said housing having a first side face and a second parallel side face, said first side face having a circular opening therethrough for the projection of one end of said shaft, and said second face having a pair of overlapping openings, one of said pair being substantially circular in shape, and the other of said pair noncircular.

4,637,413

DEGREASING APPARATUS

Michael Llewellyn, Watsall, and Stephen Holden, Telford, both of England, assignors to Safety-Kleen Corporation, Elgin, Ill.

Filed Jul. 9, 1984, Ser. No. 628,828
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—111 **6 Claims**



1. A parts washer apparatus adapted for reception beneath an automobile or like object to be repaired, said parts washer including a solvent collection and storage tank which includes a solvent storage well defined by plural side walls, at least two of which are disposed opposite each other and are subdivided into upper and lower side wall portions, with said upper and lower portions being joined to each other by a generally horizontally extending intermediate wall portions, with the top edges of all of said side walls being joined to each other to provide a top opening of a given area larger than the area of said storage well, at least two pairs of support spacers resting

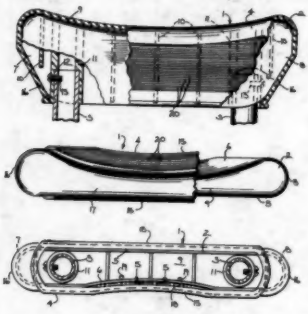
upon said intermediate wall portions, safety cover supports extending between pairs of spacers, said supports extending across the open portion of said storage well, a fire safety cover suspended from said cover supports in generally overlying relation to said storage well and having outer margins overlying said intermediate wall portions and a center panel portion overlying the opening of said storage well, fusible means suspending said cover from said cover support and retaining said cover in vertically spaced apart relation to said center well and said intermediate wall portions, a plurality of wheel assemblies extending downwardly from spaced apart portions of the underside of said intermediate wall portions of said collection and storage tank, whereby the rotational axes of said wheel portions of said wheel assemblies may lie above the bottom surface of said storage well, a pump and conduit assembly forming a part of said parts washer and disposed with said pump inlet within said solvent storage well and said pump outlet communicating with a flexible conduit having an outlet end positionable above said collection and storage tank opening, and a screen disposed above said cover support for retaining parts to be cleaned and permitting solvent return to said well through said screen.

4,637,414

ARM PIECE ASSEMBLY FOR CRUTCH

Ted F. Urban, Oshkosh, Wis., assignor to Lamico, Inc., Oshkosh, Wis.

Filed Apr. 18, 1985, Ser. No. 724,580
Int. Cl.[4] A61H *3/02*
U.S. Cl. 135—73 **13 Claims**



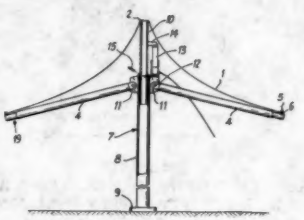
1. An arm piece assembly for a crutch, comprising an arm piece having a pair of opposed side surfaces, a pair of end surfaces and a top surface interconnecting the side surfaces and the end surfaces, said top surface being generally concave in a direction between said end surfaces, one of said side surfaces being concave in a direction between said end surfaces and being inclined upwardly in a direction toward the other of said side surfaces, connecting means disposed on the interior of the arm piece to removably receive the bows of a crutch, each end surface having an opening therein, fastening means interconnecting the connecting means with the respective bow and disposed in alignment with said opening, and a removable elastomeric cover snugly fitting over said arm piece and enclosing said openings.

4,637,415

LIGHT SHELTER IN THE FORM OF A TENT COMPRISING A ROOF CONSTITUTED BY A CANVAS

Pierre Dalo, 153, rue de Fleury, 92140 Clamart, and Jean Dalo, Rue Beaurepaire, 91410 Roinville-sur-Dourdan, both of France

Filed Jan. 14, 1985, Ser. No. 690,883
Int. Cl.[4] E04H *15/28*; A45B *11/00, 15/00*
U.S. Cl. 135—98 **7 Claims**



1. A shelter such as a tent, said shelter comprising a canvas and a pole having first and second ends, a stationary pole member and movable pole member, said stationary pole member adapted to be supported upright on a substantially horizontal surface, said movable pole member supporting said canvas along a central portion of said canvas, a plurality of substantially vertically arranged bearing plates attached to said pole about the periphery of said pole, a plurality of tensioning arms extending outwardly from said pole and being attached to respective ones of said vertical bearing plates, said canvas having a peripheral portion in the form of a hem and having a cable positioned within said hem about the peripheral portion of said canvas, a generally vertically disposed jack being removable and separably supported by one of said vertical outer bearing plates, said shelter further comprising a stop extending substantially radially outwardly from the periphery of said pole and above said jack, said jack comprising means for articulating said tensioning arms and said canvas about said pole by elevating said stop and the movable pole member, each of said tensioning arms having a first end attached to a respective one of said bearing plates and a second outer end attached to said peripheral canvas portion by a hook which is attached to said cable, said shelter having a closed position in which said arms are substantially vertical and said jack is removed from said support, and an open position in which said arms are substantially horizontal, said jack being extensible in a generally upwardly vertical fashion into abutment with said stop to move said stop and said moveable pole member upwardly, wherein said jack, said stop and said moveable pole member together comprise means for raising said arms upwardly into said substantially horizontal position, said shelter further comprising means for maintaining said peripheral portion of said canvas and said arms in a substantially horizontal position when said shelter is in said open position.

4,637,416

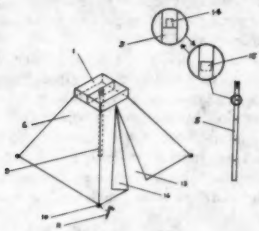
INTEGRAL LIGHTWEIGHT TENT AND BOX FOR PORTABLE APPLICATIONS

Terry McFarlin, 16536 Sharon, Chesaning, Mich. 48616

Filed Oct. 29, 1984, Ser. No. 666,250
Int. Cl.[4] E04H *15/48, 15/60, 15/30*
U.S. Cl. 135—109 **5 Claims**

1. A portable personal enclosure comprising a rectangular container in the form of a hinged box, said box hinged at the approximate center of one side so that when said box is opened completely, the halves of said side abut to form a double thick center element, said box having sufficient volume to contain the remaining elements of said enclosure, said elements comprising a plurality of collapsible fabric walls, a plurality of stakes for securing said fabric to the ground, a collapsible

central support member having at its upper end a slot for receiving said double thick center element, and additional



means for retaining the hinged box in a fixed and open configuration.

4,637,417

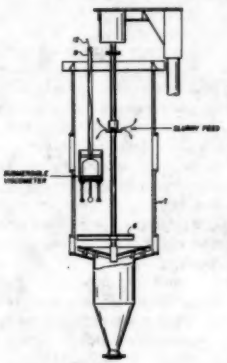
USE OF A SUBMERSIBLE VISCOMETER IN THE PRIMARY SEPARATION STEP OF THE HOT WATER PROCESS FOR RECOVERY OF BITUMEN FROM TAR SAND

Laurier L. Schramm, Edmonton, Canada, assignor to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited, all of Calgary; Gulf Canada Limited, Toronto; Her Majesty the Queen, in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources, Edmonton; HBOG-Oil Sands Limited Partnership, Calgary; PanCanadian Petroleum Limited, Calgary and Petro-Canada Inc., Calgary, all of, Canada, a part interest

Filed May 3, 1985, Ser. No. 730,173

Int. Cl.[4] F17D *3/10*

U.S. Cl. 137—4 **2 Claims**



1. In the primary separation step of the hot water process for extracting bitumen from tar sand in primary separation vessel, wherein the bitumen floats upwardly in a tar sand slurry to form a froth layer, the coarse solids drop to form a tailings layer, and a middlings layer is formed between the froth and the tailings, the improvement comprising:

providing a submerged viscometer in the middlings layer and actuating said viscometer to measure the viscosity of the middlings at one or more levels in the vertical column of middlings and produce signals, external of the vessel, which are indicative of said measurements;

taking sufficient measurements to determine the viscosity of the region of maximum viscosity within the middlings layer

and adjusting the viscosity of the middlings in response to said signals to maintain the maximum viscosity in the column below a predetermined value,

whereby the flotation of the bitumen through the middlings layer to the froth layer is substantially enhanced.

4,637,418

FLUID FRICTION REDUCTION

Curtis L. Karl, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 497,336, Mar. 20, 1983, abandoned. This application Oct. 25, 1984, Ser. No. 664,470

Int. Cl.[4] F17D *1/16*

U.S. Cl. 137—13 **10 Claims**

1. In a method for transporting or pumping liquid compositions, the improvement wherein said liquid consists essentially of an alcohol and said liquid has dissolved therein a drag reducing polymer of 2-acrylamido-2-methylpropane sulfonic acid in an amount less than 0.015% by weight based on the weight of said liquid, said polymer having a molecular weight of at least 1,000,000.

4,637,419

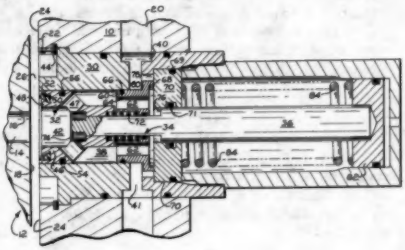
SUBSEA CONTROL POD VALVE ASSEMBLY

David W. Hughes, Houston, Tex., assignor to Vetco Offshore, Inc., Ventura, Calif.

Filed Jul. 9, 1984, Ser. No. 629,206

Int. Cl.[4] F16L *29/00*

U.S. Cl. 137—236.1 **21 Claims**



12. A subsea connector assembly comprising:

a mandrel member having at least a first fluid passage extending therethrough, said passage having first and second ends, a first end of said passage being connectable to a fluid operated well-head component, said second end of said passage defining a mandrel inlet port on an exterior interface surface of said mandrel member;

a control pod member adapted to engage and disengage from said mandrel member, said pod member having at least a first passage therein, said pod member passage having a first end connectable to a source of pressurized fluid, said pod member first passage extending from said first end to a second end which defines an outlet port on an exterior interface surface of said pod member, said exterior interface surface of said pod member being spaced from said exterior interface surface of said mandrel member to form a vent space therebetween when said pod member is engaged with said mandrel member; and

a control valve assembly mounted in said pod member first passage, said control valve assembly including:

valve body means, said body means defining a bore which terminates at a face of said body means, said body means also defining a fluid supply passage which provides fluid communication between a supply port on an exterior surface of said body means and said bore;

means for coupling said supply passage to said mandrel member passage, said coupling means being at least in part housed in said bore and including:

seal means, said seal means being moveable between a first retracted position where said seal means is located within said bore and a second extended position where said seal means is in part extended from said bore beyond said body means face across said vent space to contact said mandrel member interface surface in a region extending about said mandrel inlet port to establish a fluid tight seal to said interface surface, said seal means having a seal means fluid flow passage extending therethrough, a continuous flow path being established between said seal means flow passage and said mandrel member passage when said seal means is in the extended position,

valve means positioned within said bore, said valve means being moveable between a valve means first position where said valve means prevents fluid flow between said supply passage and said seal means flow passage and a valve means second position where said supply passage is in fluid communication with said seal means flow passage via said bore, and

means for resiliently simultaneously biasing said seal means and said valve means in first and second opposite directions, said seal means being biased toward said extended position and said valve means being biased towards said valve means first position; and

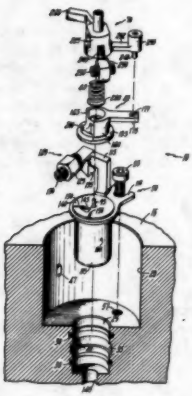
reciprocal actuator means, said actuator means extending into said bore and engaging said seal means to move said seal means against the bias of said resilient biasing means from the extended position into the retracted position during movement of said actuator means in a first of said opposite directions, said actuator means being arranged to engage said valve means to move said valve means against the bias of said resilient biasing means from said valve means first position to said valve means second position during movement of said actuator means in a second of said opposite directions.

4,637,420

METERING VALVE

Gerald P. Dyer, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1985, Ser. No. 809,367
Int. Cl.[4] B08B *1/04*; F16K *5/12, 51/00*
U.S. Cl. 137—242 **15 Claims**



1. In a valve comprising a valve body and metering element disposed thereon and rotatable with respect thereto about an axis of rotation, said valve body and metering elements being provided with windows therein, each of said windows including edge portions said windows collectively defining at least in part, a fluid flow passage through said valve, and being selectively registrable by adjustment of the relative rotary position of said metering element with respect to said valve body, the improvement characterized by:

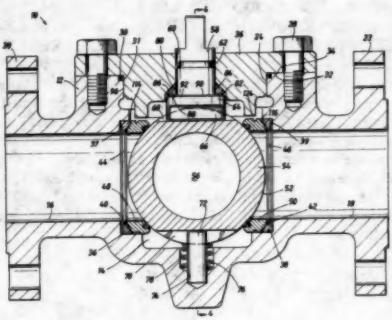
one of said windows including a curved outer edge portion of continuously varying radius with respect to said axis of rotation for progressively closing said flow passage in a radially inward direction by rotation of said metering element, whereby solid contaminants lodged between said windows in said passage are urged radially inwardly by said rotation of said metering element to enhance breakage thereof by shearing between the edge portions of said metering element and valve body windows.

4,637,421

IN-LINE REPAIRABLE TOP ENTRY BALL VALVE

Gerald A. Stunkard, P.O. Box 748, Gladewater, Tex. 75647

Filed May 15, 1986, Ser. No. 863,361
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—327 **41 Claims**



1. An in-line repairable top entry ball valve, comprising:

(a) a body forming a valve chamber and flow passage means intersecting said valve chamber, said body further forming an access opening in communication with said valve chamber, seat recess means concentrically about said flow passage and arcuate ball/seat spacer receptacle means substantially concentric with said seat recess means;

(b) a ported spherical plug member being positioned for rotation within said valve chamber between open and closed positions relative to said flow passage, said spherical plug member being of a dimension for passage through said access opening;

(c) resilient seat means being disposed within said seat recess means and being positioned in spaced relation with said spherical plug member and defining sealing surface means disposed in concentric relation with said spherical plug member, said resilient seat means being in the form of at least one annular seat member composed of resilient material;

(d) ball/seat spacer means being disposed in sealing engagement with said spherical plug member and said resilient seat means, said sealing engagement being interference sealing engagement induced thereto by said resilient seat means, said ball/seat spacer means being of a dimension for passage through said access opening and being insertable into and removable from said arcuate ball/seat spacer receptacle means with said spherical plug member present within said valve chamber and said resilient seat means present within said seat recess;

(e) bonnet means forming a sealed closure for said access opening and defining a retainer projection disposed to

secure said ball/seat spacer means against inadvertent displacement; and

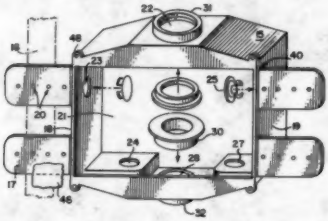
(f) an operating stem extending through said bonnet means and having driving interconnection with said spherical plug member for rotation thereof between open and closed positions relative to said flow passage.

4,637,422

PLASTIC WASHING MACHINE BOX WITH HINGED MOUNTING BRACKETS

Lewis B. Izzi, Sr., Shelby, N.C., assignor to Plastic Oddities Inc., Shelby, N.C.

Filed Jan. 16, 1986, Ser. No. 819,257
Int. Cl.[4] F16L *5/00*
U.S. Cl. 137—360 **13 Claims**



1. A laundry interface box serving as a connection junction box between plumbing connections in a wall and a washing machine adapted for recessed installation on the studs of a laundry room wall, comprising in combination,

a framework forming a box with a front opening, a back panel and four side walls extending substantially perpendicular from the back panel,

a set of holes extending through the walls adapted for terminal plumbing connections to water and drain pipes located in the laundry room walls, and

a plurality of substantially planar brackets for attachment of the box to the studs of the laundry room wall with each bracket pivotably attached to a side wall of the box to pivot between respective positions parallel to and adjacent the side wall to which the bracket is attached for compact storage of the box and perpendicularly extending from the side wall away from the box for attachment thereof to a wall stud.

4,637,423

PNEUMATIC GAS CYLINDER VALVE ACTUATOR

David K. Gray, 116 Dovefield Dr., Lockhart, Tex. 78640

Filed Sep. 27, 1985, Ser. No. 780,963
Int. Cl.[4] F16K *27/08*
U.S. Cl. 137—382.5 **8 Claims**

1. A pneumatic gas cylinder valve actuator for operating a manual valve on a gas cylinder comprising:

(a) an actuator valve body up to 4 inches thick, up to 8 inches wide, and up to 10 inches long,

(b) a flat toothed operator gear centrally located in said actuator valve body with a flat plane of said flat toothed operator gear parallel to a longer, flat plane of said actuator valve body,

(c) two piston chambers within said actuator valve body, horizontally opposed with one on either side of said flat toothed operator gear, with a bottom central opening of said piston chambers communicating with said flat toothed operator gear,

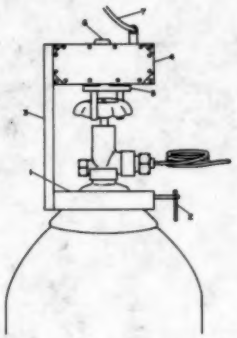
(d) two pistons, one in each of said piston chambers,

(e) sealing means for each of said pistons,

(f) means for introducing and venting up to 100 psi air pressure in said piston chambers above each of said pistons,

(g) means for translating movement of said pistons to operate said manual valve on said gas cylinder to open when said air pressure is admitted into said piston chambers above said pistons,

(h) spring loading means under each of said pistons to reverse said movement of said pistons to close said manual valve when said air pressure is vented from said piston chambers,



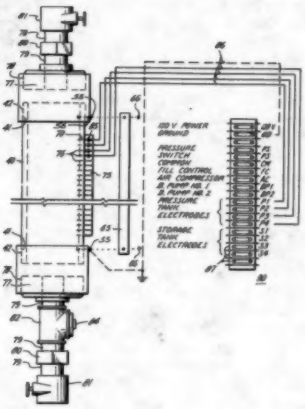
(i) means for adjusting said spring loading means to provide up to 100 inch pounds of torque holding said manual valve in a closed position.

4,637,424

PROBELESS FLUID LEVEL CONTROLLER

Charles L. Morgan, III, P.O. Box 739, Katy, Tex. 77492-0739

Filed May 23, 1985, Ser. No. 738,015
Int. Cl.[4] F16K *31/02*; G01F *23/00*
U.S. Cl. 137—392 **9 Claims**



4. A probeless level control system for use in monitoring and controlling the level of a conductive fluid within a container, comprising:

a tube having a wall connection means for connecting said tube to the container of fluid;

a terminal strip having a plurality of locations thereon attached to said tube;

a first plurality of screws corresponding to said plurality of locations, said first plurality of screws extending through said strip and into the interior of said tube through said wall;

seal means for sealing the interface between said first plurality of screws and said wall, said seal means including a mixture of equal parts of epoxy and filings from said wall mixed to a consistency of thick paint and applied to the interface between said screws and said wall for forming

fluid and pressure tight seals between said screws and said wall;

a level controller;

conductive means for electrically connecting preselected ones of said screws with said level controller.

4,637,425

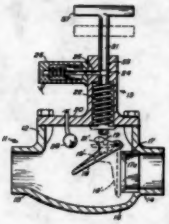
SEWER CHECK VALVE WITH CUTTING SEAT

Robert E. Petersen, R.R. 1 Box 254, Walcott, Iowa 52773

Filed Jun. 2, 1986, Ser. No. 869,608

Int. Cl.[4] F16K *31/02, 15/18, 31/18, 33/00*

U.S. Cl. 137—412 **8 Claims**



1. A positively operating sewer check valve comprising:

a housing having an inlet for normal direction of flow of sewage and an opposite outlet, a flap having a pivotal connection to said inlet to provide check-valve action, the surface about said inlet being a first sealing surface and facing into said housing, said flap having a second sealing surface within the periphery thereof facing said first sealing surface and sealing therewith during closure of said valve, one of said sealing surfaces being a knife-edge facing the other of said sealing surfaces, said other sealing surface being a smooth blunt surface where contacted by said knife-edge to provide unobstructed flow of sewage away from said knife-edge,

a rigid actuating member operatively connected to said housing, said actuating member having operated and unoperated positions, a spring connected to said actuating member, said flap having a portion spaced from said pivotal connection thereof and contacted by said actuating member at least during operation thereof, said spring while said actuating member is operated urging said flap toward said first sealing surface to aid pressure of any back flow to cut through any sewage between said sealing surfaces,

a releasing mechanism connected to said housing and adapted to engage said actuating member, said releasing member normally locking said actuating member in opposition to force of said spring in said unoperated position for allowing said flap to open by the flow of sewage, and

means for actuating said releasing mechanism to unlock said actuating member and thereby permitting said spring to urge said actuating member into said operated position to cause the actuating member to engage said flap and urging it to seat against said first sealing surface and aiding pressure of any backflow to cut through any sewage between said sealing surfaces.

4,637,426

FILL CONTROL VALVE

Ronald J. Lyon, 12029 Smallwood, Downey, Calif. 90241

Filed Nov. 12, 1985, Ser. No. 796,999

Int. Cl.[4] F16K *31/22, 15/04*

U.S. Cl. 137—433 **12 Claims**

7. A valve for controlling the filling of a container with a liquid, comprising

a body portion,

an outlet portion at one end of said body portion,

a cage portion at the opposite end of said body portion,

a bore which passes axially through each of said body portions, said outlet portion and said cage portion.

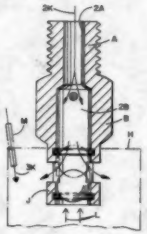
at least one aperture in the said of said cage portion which communicates with the bore therethrough,

ball means supported in said cage portion,

sealing means provided adjacent the juncture of said cage portion and said body portion,

retaining means provided at the unattached end of said cage portion to retain said ball means within said cage portion,

said sealing means adapted to receive said ball means for selectively forming a seal to prevent fluid from passing



through said bore from said cage portion through said body portion, and

pin means disposed in said body portion and arranged radially relative to said bore for diverting a liquid flow within said bore, and a portion of said ball means extending into said bore and adjacent said at least one aperture when the ball means is received by said sealing means for continuously and further diverting the liquid flow through the side of said cage portion.

4,637,427

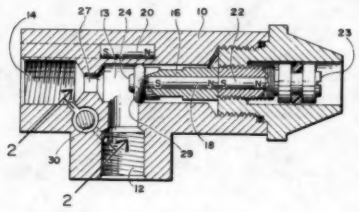
MAGNETIC VALVE

John H. Nolan, and William A. Nolan, both of 234 SW. 12th Ave., Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 531,848, Sep. 14, 1983, abandoned. This application May 30, 1985, Ser. No. 739,362

Int. Cl.[4] F16K *17/28*

U.S. Cl. 137—460 **2 Claims**



1. A fluid control valve with re-set mechanism, the valve including a housing, a fluid inlet passage therein, and a fluid outlet passage in communication with said fluid inlet passage, said fluid control device comprising:

(a) a re-set channel formed in said housing, connecting said fluid inlet and outlet passages;

(b) an externally movable re-set valve normally blocking said re-set channel;

(c) a reciprocating valve capable of permitting, limiting, or precluding communication between said inlet and outlet passages, said valve comprising a ferromagnetic armature defining a magnetic axis along its axis of reciprocation, said magnetic axis generally corresponding to the longitudinal center of a fluid-tight chamber within said housing within which said valve may reciprocate, said valve having a variable flow-responsive integral first radial end face

disposed within a region of communication between said inlet and outlet passages, said outlet passage having an entrance geometry complemental to the geometry of said first end face;

(d) a fixed pole magnet disposed within said housing and magnetically proximate to said area of communication between the inlet and outlet passages, said fixed pole magnet having a magnetic axis disposed in magnetic communication with the magnetic axis of said valve, to normally attract and hold said valve when said valve is open, and to normally repel said reciprocating valve toward its open direction when said valve is closed; and

(e) magnetic bias and calibration means disposed within said housing and disposed co-linearly and normally in contact with said reciprocating valve, near a radial end thereof opposite to said flow-responsive radial end of said valve, said bias and calibration means provided with an axis of magnetic polarity substantially co-linear with said magnetic axis of said reciprocating valve, in which said reciprocating valve is normally magnetically and thereby mechanically balanced between (i) the force of magnetic attraction, at said first radial end face, between said end of said reciprocating valve and that end of said fixed pole magnet proximate thereto, and (ii) the force of the magnetic contact of said bias and calibration means against said opposite radial end face of said reciprocating valve, said bias and calibration means further comprising external means for selectably advancing said flow-responsive first radial end face partially into said region of inlet-outlet communication to thereby correspondingly calibrate the level of fluid flow necessary to overcome the magnetic co-action between said bias and calibration means, and said reciprocating valve, to thereby precisely regulate the closure thereof,

whereby the reliability of the function of the open and re-set condition of the reciprocating valve is enhanced by the position and function of said fixed pole magnet and, further whereby, the resetting of said valve to its normally open position after an excess of fluid pressure has ceased to exist, may be insured by the opening of said externally moveable re-set valve to thereby permit communication between the inlet and outlet passages of said re-set channel, thereby creating an equalization of pressure between said inlet and outlet passages, thus reducing to zero the pressure differential across the region of communication between said inlet and outlet passages, by eliminating any residual relative vacuum pressure upon the port face of the reciprocating valve that might otherwise prevent the prompt return of the valve to its normally open position.

4,637,428

FLUID FLOW CONTROL VALVES

Bengt Berglund, Forel, Switzerland, assignor to Spiro Investment A.G., Boesingen, Switzerland

PCT No. PCT/GB84/00185, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04805, PCT Pub. Date Dec. 6, 1984

PCT Filed May 25, 1984, Ser. No. 694,756

Claims priority, application United Kingdom, May 26, 1983, 8314621; Nov. 3, 1983, 8329333

Int. Cl.[4] G05D *7/01*

U.S. Cl. 137—503 **5 Claims**

1. A fluid control valve for connection into a run of ducting having a predetermined cross-sectional area, said valve including:

(a) a valve casing having an inner face including an inlet region of substantially uniform cross-sectional area, a tapered region tapering outwardly from said inlet region to an outlet region;

(b) a valve member having a valve head convex in a direction toward said inlet region and axially movable within said tapered region to vary the annular gap between said valve head and said tapered region;

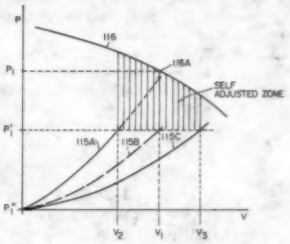
(c) actuator means for actuating said valve member comprising:

(i) first and second expansible chambers joined by a common movable wall;

(ii) a first sensing conduit fluidly connecting a location upstream of said valve member with said first expansible chamber;

(iii) a second sensing conduit fluidly connecting a location downstream of said valve member with said second expansible chamber;

(iv) a mechanical linkage connecting said valve member with said movable wall;



(v) biasing means comprising at least one further expansible chamber arranged coaxially with said first and second expansible chambers and coupled thereto, said at least one further expansible chamber being charged with fluid having a predetermined pressure at a given state of compression of said at least one further expansible chamber;

(vi) whereby said actuator means adjustably controls the position of said valve head to maintain substantially constant fluid flow regardless of the pressure drop across said valve head.

4,637,429

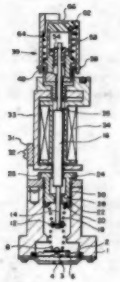
FLUID PRESSURE REGULATING VALVE HAVING ADJUSTABLE TWO-STAGE AND NATURAL-LP GAS CHANGEOVER CAPABILITIES

Paul Dietiker, Redondo Beach, Calif., and Marvin D. Nelson, St. Louis Park, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 11, 1985, Ser. No. 786,443

Int. Cl.[4] G05D *16/06, 16/20*

U.S. Cl. 137—505.14 **3 Claims**



1. A fluid pressure regulating valve comprising

a flow rate control diaphragm means,

a pressure regulating spring means bearing on said diaphragm means,

first means for adjusting a high flow rate position of said spring means,

second means coaxial with said first means for adjusting a low flow rate position of said spring means and

pressure changeover means coaxial with said first and second means for adjusting said spring means between a first and a second regulating pressure diaphragm actuating means including an armature having a first end operatively associated with said first means, said second means and said changeover means and a second end operatively associated with said pressure regulating spring means, a selectively energizable solenoid coil, a hollow valve body enclosing said diaphragm and a valve orifice and said selectively energizable solenoid coil arranged to urge said armature to a first position in opposition to said spring means, an adjusting assembly means mounted on a wall of said valve body for coaxially supporting said first means, said second means and said changeover means and said first end of said armature and a stop means captured on said first end of said armature to limit the movement of said first means, said second means and said changeover means.

4,637,430

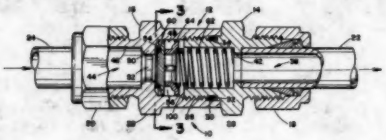
CHECK VALVE

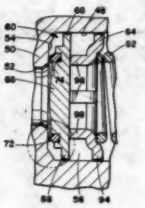
Gary W. Scheffel, Streetsboro; Richard J. Medvick, Shaker Heights, and William C. Steiss, Parma, all of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Dec. 31, 1985, Ser. No. 815,377

Int. Cl.[4] F16K *17/04*

U.S. Cl. 137—516.29 **22 Claims**





1. A poppet check valve comprising:

(a) mating body forming sections which define a valve chamber having a cylindrical inner wall;

(b) a generally cylindrical inlet passage connecting with said valve chamber axially thereof;

(c) a shoulder at the juncture between said inlet passage and said chamber, said shoulder defining an annular valve seat;

(d) a relatively thin disk-like valve element positioned in said valve chamber to extend transversely thereof, said valve element having a generally circular imperforate central section of a diameter greater than the diameter of said inlet passage but less than the diameter of said valve chamber and a plurality of legs extending radially from the periphery of said central section into sliding engagement with the inner wall of said valve chamber;

(e) a circular seal element joined to said central section at a location inwardly of its outer periphery and extending axially toward said valve seat;

(f) a coil spring mounted in said valve chamber and extending axially thereof for maintaining a continual bias on said valve member in a direction toward said seat; and,

(g) a poppet stop member positioned between said spring and said valve element, said stop member including a plurality of circumferentially spaced axially extending force applying elements for engaging said central section of said valve element on the side opposite said seal elements, and guide surface means extending radially outwardly of said force applying elements into sliding engagement with the inner wall of said valve chamber at a location axially spaced from said valve element.

4,637,431

SUPPLY CONTROL VALVE WITH INTEGRAL PRESSURE LIMITER

John F. Taplin, 15 Sewall St., W. Newton, Mass. 02165

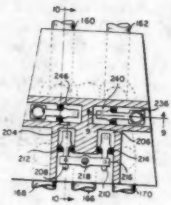
Division of Ser. No. 602,420, Apr. 20, 1984, Pat. No. 4,540,020.

This application Aug. 8, 1985, Ser. No. 763,938

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—596.15 **1 Claim**



1. A pilot operated supply and waste control valve of the type comprising two main valves associated with at least one load port for alternately supplying and exhausting a supply fluid to and from each load port and control means for applying fluid control pressure to open and close a main supply valve associated with each load port while conversely closing and opening a main waste valve associated with each load port, wherein:

each main valve comprises a diaphragm which presses against a valve seat with a high pressure applied to a control surface of the diaphragm opposite to the valve seat; and

the control means is a four-way control valve actuated by a single solenoid and comprises:

first and second output pressure chambers, each having a high pressure inlet port in communication with a source of said supply fluid, a low pressure inlet port and an output control conduit for applying opposite high and low pressures to the control surfaces of the diaphragms of said main supply and waste valves associated with each load port; and

a valve member associated with each output pressure chamber, each valve member being positioned between the high and low pressure inlet ports to move alternately against the high and low pressure inlet ports to close the ports, with the high pressure port to one output pressure chamber closed by one valve member as the opposite, low pressure port to the other output pressure chamber is closed by the other valve member such that the main supply or main waste valve of each load port is opened due to the resultant pressure in one of the chambers and the other main valve of each load port is closed due to the resultant pressure in the other chamber, and the positions of the main valves of each load port are reversed with actuation of the single solenoid, all moving elements of the

four way control valve which are exposed to the supply fluid being free of sliding relationship with other elements.

4,637,432

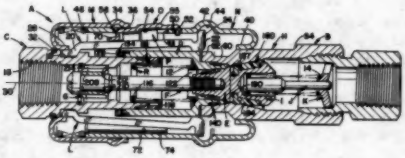
COUPLING

Richard J. Medvick, Shaker Heights; Richard C. Weber, Jr., Hudson; Ross L. Wagner, Akron, and Edward M. Brand, Cuyahoga Falls, all of Ohio, assignors to Swagelok Company, Hudson, Ohio

Filed Jan. 19, 1983, Ser. No. 459,150

Int. Cl.⁴ F16L *29/00*

U.S. Cl. 137—614.03 **30 Claims**



1. A quick connect/disconnect coupling comprising: a pair of separate coupling members positionable together in cooperative relationship along a longitudinal axis; latch means for releasably latching said coupling members together and being movable between latched and unlatched positions; operating means movable to a releasing position for releasing said latch means for movement from said latched position to said unlatched position; stop means mounted on and carried by said operating means for blocking movement of said operating means to said releasing position, said stop means including a blocking portion selectively movable to an unblocking position to free said operating means for movement to said releasing position; and, said operating means being movable to said releasing position upon direct application thereto of manual force acting in a direction generally parallel to said longitudinal axis and; said stop means further including an actuating portion accessible exteriorly of said operating means for moving said blocking portion to said unblocking position upon direct application to said actuating portion of manual force applied exteriorily of said stop means in a direction transversely of said longitudinal axis.

4,637,433

SOLENOID VALVE

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

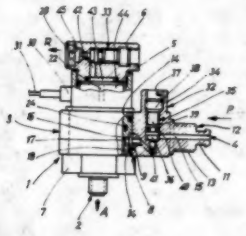
Continuation of Ser. No. 663,438, Oct. 22, 1984, abandoned.

This application Dec. 19, 1985, Ser. No. 814,003

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338418

Int. Cl.⁴ F16K *31/08*

U.S. Cl. 137—625.65 **12 Claims**



5. A solenoid valve comprising:

a valve body having an inner axially extending cylindrical bushing space and an outer axially extending cylindrical surface, said valve body having a floor for bounding a lower end of said cylindrical bushing space, said cylindrical bushing space being open at an end opposite from said floor, said valve body having a first threaded pressure connection extending axially from said floor defining a first fluid duct;

a swivel member rotatably mounted on said valve body, said swivel member having a ring portion slidably engaged over said outer cylindrical surface of said valve body and a second pressure connection extending radially from said ring portion with respect to said valve body, said second pressure connection having a second fluid duct therein, said valve body and said ring portion defining a first annular grooved passage therebetween communicating with said second fluid duct;

a valve cartridge having an outer cylindrical surface disposed in said axial cylindrical bushing space of said valve body, said valve body having a fluid connection for establishing communication between said first annular grooved passage and said outer cylindrical surface of said valve cartridge, said valve cartridge having a first port for communication with said first fluid duct, and a second port for establishing communication with said fluid connection, said valve cartridge defining a valve body space therein communicating with said first and second ports, a valve member movable in said valve body space for closing off communication between said first and second ports and for establishing communication between said first and second ports, and magnetic means for moving said valve member; and

cover means connected to said valve body for covering said axial cylindrical bushing space of said valve body, said cover means including a third fluid duct extending axially therein communicating with a fourth fluid duct in said cartridge, both said third fluid duct and said fourth fluid duct establishing communication between said valve body space and an exterior of said valve body, said valve member while moved for establishing communication between said first and second ports, also arranged for closing off communication to said fourth fluid duct in said cartridge;

said swivel member including a first throttle valve space communicating with said second fluid duct and a first throttle member engaged in said first throttle valve space for regulating a flow of fluid into said second fluid duct, said cover means including a second throttle valve space with a second throttle valve member movable in said second throttle valve space, said second throttle valve space communicating with said third fluid duct with flow through said third fluid duct being regulatable by a position of said second throttle valve body.

4,637,434

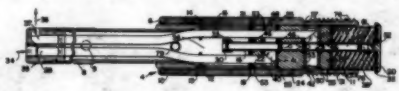
THREE-WAY VALVE FOR AN ATTENUATOR

Carl J. Moen, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 7, 1985, Ser. No. 742,259

Int. Cl.⁴ F16L *55/04*

U.S. Cl. 137—625.66 **4 Claims**



1. A three-way valve for use in a fluid pulsation attenuator type having a flexible diaphragm disposed to move between lower, neutral and upper positions, the diaphragm having one side thereof contacting the fluid having pulsations to be attenu-

ated and the other side disposed to contact the valve, the valve comprising:

an elongate, hollow casing extending within the attenuator having an air inlet for introducing air thereinto, an air outlet for releasing exhaust from the interior thereof;

first and second chambers within the casing, spaced apart therein, and in fluid communication with the air inlet and air outlet, respectively;

a valve head for non-secured, contacting engagement with the diaphragm;

a bore within the casing, said bore having a soft spring means interposed between the valve head and a plate within the bore on one end of the casing;

an elongate sliding tube slidably disposed within the casing having one end attached to the valve head and the other end terminating within the casing, said sliding tube including a plurality of orifices in the wall thereof, said orifices disposed between said first and second chambers when the sliding tube is in its neutral position, and movable between the first and second chambers following corresponding movement of the valve head against the diaphragm, said movement of the orifices into the first and second chambers establishing air communication therebetween and the interior of the casing via the sliding tube;

port means in the casing linking the interior of the casing with the exterior thereof, whereby reciprocal movement of the sliding tube permits selective air communication between the first and second chambers with the interior of the attenuator air tank.

4,637,435

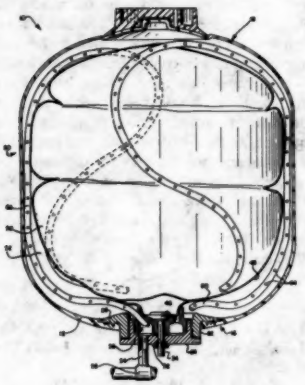
ANTISEAL ARRANGEMENT FOR HYDROPNEUMATIC PRESSURE TANKS

Charles P. Chirdon, Painesville, Ohio, assignor to Essef Corporation, Mentor, Ohio

Filed Aug. 8, 1985, Ser. No. 763,561

Int. Cl.[4] F16L *55/00*

U.S. Cl. 138—30 **5 Claims**



1. An accumulator tank for pressurizing and supplying liquid to a system, comprising a pressure vessel having a wall defining a closed pressure chamber, access fitting means in said pressure vessel defining an inlet/outlet port means for admitting liquid under pressure to the interior of the vessel and defining an air inlet port for admitting pressurized air to the interior of the vessel, flexible air cell means in fluid communication with said air inlet port and separating said closed chamber into first and second variable volume compartments respectively containing the air and the liquid, perforated conduit means in said second compartment in fluid communication with said port means and extending between the wall of the pressure vessel and said flexible air cell means, said conduit means comprising tubing following a sinusoidal path and having perforations adapted to provide fluid communication between said outlet port means and portions of said second compartment when said air cell means seals against said wall to otherwise isolate those portions of the second compartment but for the fluid communication provided by said perforations of said conduit means.

4,637,436

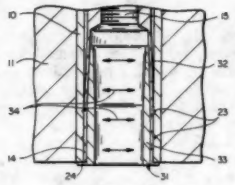
ANNULAR TUBE-LIKE DRIVER

John B. Stewart, Jr., San Francisco; Laszlo Szalvay, San Carlos; Bernard de Brunier, Mountain View, and Jeffrey W. Simpson, Sunnyvale, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 700,373, Feb. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 552,187, Nov. 15, 1983, abandoned. This application Nov. 5, 1985, Ser. No. 797,351

Int. Cl.[4] F16L *55/10*

U.S. Cl. 138—89 **13 Claims**



9. A composite structure comprising:

an annular tube insert for insertion within a tube, said insert having an external surface for engagement with the inside tube surface of a tube and being closed at one end to plug said annular tube, said insert having threads at the closed end of the insert; and

an annular tube-like driver within said tube insert made of a shape-memory alloy having a martensitic state and an austenitic state having a configuration such that when it is inserted in its martensitic state it is capable of exerting an outward pressure on said insert while simultaneously being deformed by said insert and when upon transforming to its austenitic state it is capable of recovery to its non-deformed condition to increase the pressure between the insert and the inside tube surface.

4,637,437

BRAKE FOR A WEAVING MACHINE

Wolfgang Greger, Gundetswil, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 13, 1984, Ser. No. 650,224

Claims priority, application Switzerland, Oct. 6, 1983, 5440/83

Int. Cl.[4] D03D *51/00*; F16D *51/00*

U.S. Cl. 139—336 **8 Claims**

1. A brake for a weaving machine comprising

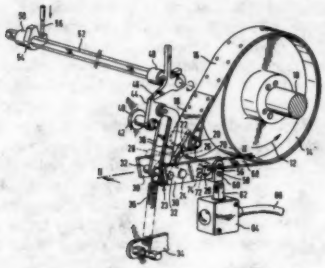
a rotatable brake drum;

a brake band disposed about said drum to selectively brake rotation of said drum;

a brake lever for engaging one end of said brake band; and

a resilient member having a part between said lever and said

one end of said brake band for compression forces therebetween, said part having a plurality of parallel apertures



therein for damping vibrations in said member during transmission of forces between said band and said lever.

4,637,438

METHOD AND DEVICE FOR FILLING CONTAINERS

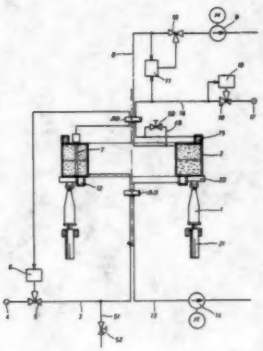
Wilhelm Weiss, Regensburg, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 766,496

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431107

Int. Cl.[4] B65B *55/24;* B67C *3/06*

U.S. Cl. 141—6 **9 Claims**



1. A method of filling containers such as bottles with a liquid which partially fills a tank and the space above the liquid is filled with a protective gas, said method including the steps of:

evacuating most of the air from a bottle while the bottle is isolated from the atmosphere,

filling said bottle with said gas from the tank to a pressure equal to the pressure in the tank,

causing said liquid to flow by gravity from said tank to said bottle until the bottle is filled to a predetermined level and said liquid in the bottle displaces said gas back into said tank except for residual gas slightly diluted with air above said level,

briefly injecting a quantity of pure protective gas into said bottle in excess of the quantity necessary to displace said residual gas, and

conducting the displaced gas and excess pure protective gas to the gas filled space in the tank before the contents of said bottle are exposed to the atmosphere.

4,637,439

MINI-REGULATOR VALVE ASSEMBLY

Edward L. Jeans, Gwent, Wales, assignor to Cadbury Schweppes, PLC, London, United Kingdom

Continuation-in-part of Ser. No. 232,977, Feb. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 200,021, Oct. 23, 1980, Pat. No. 4,353,252. This application Jun. 28, 1983, Ser. No. 508,558

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—18 **25 Claims**

1. A regulating valve for use in a gas cylinder having an opening formed therein comprising:

(a) a first valve member adapted to be retained in the opening in the cylinder;

(b) a second valve member disposed for movement with respect to said first valve member, one of said first and second valve members forming a valve seat and the other forming a sealing edge cooperating with said seat thereby forming an outlet valve from the cylinder;

(c) first biasing means biasing said second valve member against said first valve member so as to bring said sealing edge into contact with said seat and close said valve;

(d) an actuator for acting on said second valve member, said actuator having an outlet passage, said actuator supported for limited axial motion;

(e) means associated with said actuator forming an inner chamber in communication with said outlet valve, said inner chamber having an outer surface of area greater than the area of said outlet passage, and an outer chamber;

(f) at least one port formed in said actuator establishing communication between said inner chamber and said outlet passage;

(g) an axially adjustable support surface; and

(h) second biasing means disposed in said outer chamber between said support surface and said actuator, whereby axially inward movement of said actuator will cause it to move said seat and edge apart to permit a flow of gas into said inner chamber and through said ports, said gas thereupon acting over said outlet passage along with the biasing force of said second biasing means and aided by the biasing force of said first biasing means to tend to close the valve comprising said valve seat and said edge as pressure builds up to the desired value to thereby obtain a regulating effect.

4,637,440

VENTLESS LIQUID RECOVERY SYSTEM FOR PRESSURIZED GAS LINES

Troy J. Potter, 200 Bailey, Dumas, Tex. 79029

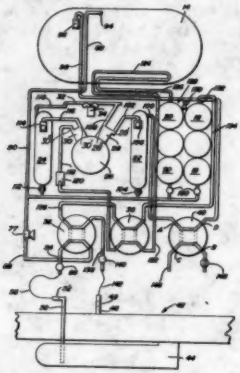
Filed Apr. 24, 1985, Ser. No. 727,243

Int. Cl.[4] B65B *3/04, 31/04*

U.S. Cl. 141—65 **16 Claims**

1. A liquid recovery system for a pressurized gas line including a liquid sump to be evacuated of liquid through a valve

controlled liquid discharge line, said system incorporating medium pressure storage tank structure including liquid inlet structure and valved liquid outlet structure as well as vapor outlet structure, gas pump structure including suction and discharge ports, high pressure storage tank structure including



gas inlet and gas outlet structure, a first conduit communicating said liquid discharge line with said liquid inlet structure, a second conduit communicating said vapor outlet structure with said suction port, and a third conduit communicating said discharge port with said gas inlet structure.

4,637,441

INLET AND OUTLET VALVES

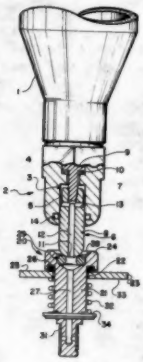
Rodney Gomersall, 82 Banks Road, Slaithwaite, Near Huddersfield, West Yorkshire, England

Continuation-in-part of Ser. No. 578,141, Feb. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 503,533, Jun. 13, 1983, abandoned. This application Aug. 5, 1985, Ser. No. 763,308

Claims priority, application United Kingdom, Jun. 15, 1982, 8217269

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—349 4 Claims



1. An inlet and an outlet valve for respective pressure vessels, adapted to cooperate with each other to transfer pressure fluid from one of the vessels to the other, the outlet valve including a sealing member, said sealing member being adapted to form a seal with its pressure vessel from inside said vessel; said outlet valve including a passageway, said passageway being arranged to communicate between the inside and the outside of the pressure vessel; and an operating member, said operating member extending through and being slidably mounted in said passageway and said operating member including a nozzle, said nozzle projecting from said passageway, said outlet valve further including a projection, said projection being arranged to cooperate with said operating member whereby removal of the operating member from the passageway is prevented, said projection being movable to a position in which said operating member may be removed with said sealing member remaining adapted to seal its pressure vessel; said inlet valve including a sealing portion; the valves being adapted to cooperate with each other to transfer fluid out of the outlet valve in through the inlet valve by urging said nozzle against said sealing portion to form a seal between said nozzle and said sealing portion, said urging of said nozzle against said sealing portion also causing urging of said operating member towards said sealing member of said outlet valve to cause the seal of said sealing member with its pressure vessel to be broken.

4,637,442

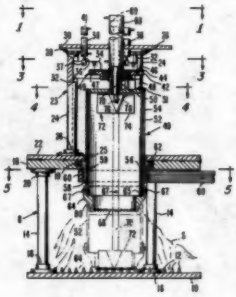
MACHINE FOR CORING STUMPS

Daniel S. Mozer, 126 Grandview Ave., Yardville Heights, N.J. 08620

Filed Aug. 20, 1985, Ser. No. 767,398

Int. Cl.[4] A01G *23/06;* B27L *7/00*

U.S. Cl. 144—2 N 23 Claims



1. A machine for coring stumps, comprising:

(a) a support structure;

(b) an annular saw means mounted in said structure for rotation and for advancement along its axis of rotation, through a stump to be cored;

(c) means for rotating said saw means; and

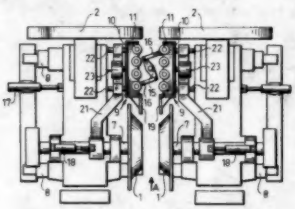
(d) means for advancing the saw means, simultaneously with rotation thereof, to remove a core from said stump, the cylindrical saw means including an elongated hollow cylinder for confining the core while the core is being cut from the stump, said cylinder having a leading end and a trailing end in the sense of the direction in which the saw means is advanced through the stump, and an annular saw blade on the leading end of the cylinder, the support structure including a base adapted to provide a support for the stump to be cored, said saw means being mounted upon the support structure above the base for movement downwardly through the supported stump.

4,637,443

SAW ASSEMBLY

Kurt Jansson, Mariannelund, Sweden, assignor to AB A. K. Eriksson, Mariannelund, Sweden

Filed Sep. 11, 1985, Ser. No. 774,682
Claims priority, application Sweden, Sep. 14, 1984, 8404638
Int. Cl.[4] B27C 9/00; B27B 1/00
U.S. Cl. 144—39 9 Claims



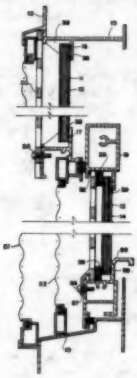
1. A saw assembly for reducing logs by passing the logs at least once through the assembly and resawing the thus obtained blocks by re-passing the blocks through the saw assembly, comprising a pair of chippers and at least one pair of band saws located downstream of the chippers, and a pair of guide-and-feed devices located between the chippers and the band saws, the components in each of these pairs of assembly units being located opposite one another on different sides of the saw centre line and being adjustable in relation thereto, the saw assembly further comprising means operative to cause the guide-and-feed devices to accompany synchronously the setting movements of the chippers relative to the centre of the saw line when reducing passing logs; and means which are operative, prior to a resawing operation, to displace the guide-and-feed devices relative to the chippers in a direction towards the centre of the saw line for engagement with the wood block to be resawn, this block passing free from the chippers.

4,637,444

WINDOW PROTECTION

Paul W. Tanner, Rte. 3, Box 1608, Keystone Heights, Fla. 32656

Filed Nov. 13, 1984, Ser. No. 671,112
Int. Cl.[4] E06B 3/32
U.S. Cl. 160—91 11 Claims



1. A window unit comprising a window frame, at least a lower window member vertically slideably disposed in said window frame;

said window member including a framework formed by two vertical supports, an upper horizontal support and a lower horizontal support with a pane of window glass within said framework;

a sheet of expanded metal spaced apart from said pane and covering the outside surface of said pane, said sheet having outer edges within said framework upper horizontal support and vertical supports;

a resilient spacer located substantially about the perimeter of said pane and sandwiched between said pane and said sheet; and

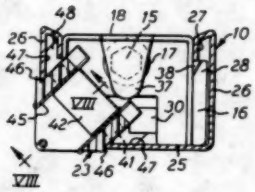
connecting means to rigidly fasten said sheet along its lower edge portion to said lower horizontal support of said window framework.

4,637,445

ARRANGEMENT IN VENETIAN BLINDS

Berndt R. Nilsson, Adolf Fredriksgatan 6, S-217 74 Malmö, Sweden

Division of Ser. No. 403,084, Jul. 29, 1982, Pat. No. 4,531,563.
This application May 9, 1985, Ser. No. 732,099
Claims priority, application Sweden, Aug. 7, 1981, 8104739
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] E06B 9/30
U.S. Cl. 160—178 C 2 Claims



1. An arrangement in Venetian blinds comprising a substantially U-shaped mounting rail with a web and bent legs and lead-ins for the ladder-tapes, cords and slat operating means, the arrangement further comprising means in the mounting rail for supporting an operating shaft, said operating shaft being connected with the ladder-tapes and adapted to control the angular position of said ladder-tapes and, thus, the angular position of the slats, the operating means of said arrangement comprising a driving device for said operating shaft and a cord lock, wherein said mounting rail has a mounting hole for the cord lock, said mounting hole extending into the web and one leg on either side of the corner of the mounting rail between the web of the rail and said one leg of said rail, and wherein said cord lock is insertable in said mounting rail from the inner side thereof and has snap-in detent means adapted to be moved through said mounting hole solely under deformation of said snap-in detent means and/or said mounting rail for engaging, after mounting, with the edge portions of said mounting hole on either side of said corner; and wherein said cord lock also has abutment faces engaging with the inner side of said one leg and web of said mounting rail and adapted to maintain said snap-in detent means substantially in engagement with said edge portions.

4,637,446

BUILDING AND BI-FOLD DOOR ASSEMBLY

Coy E. McQueen; Lynn O. Twedt, both of Harvard, Ill., and Edwin H. Thurnau, Delavan, Wis., assignors to Erect-A-Tube, Inc., Harvard, Ill.

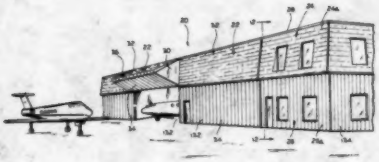
Filed Dec. 5, 1984, Ser. No. 678,582
Int. Cl.[4] E05D 15/26
U.S. Cl. 160—207 38 Claims

1. A bi-fold door assembly movable between raised and lowered positions for mounting in a building, comprising:

an upper door section hinged to a lower door section, said

door sections having front surfaces adapted to face outwardly of said building, said door sections having rear surfaces adapted to face inwardly of said building;

said outwardly facing front surface of said upper door section being disposed in a plane intersecting a plane defined by said outwardly facing front surface of said lower door section in said lowered position of said door assembly, the plane defined by said outwardly facing front surface of said lower door section being a vertical plane and a top of said upper door section being disposed in said vertical



plane in said lowered position of said door assembly, said outwardly facing front surface of said upper door section being sloped downwardly and outwardly of the top thereof to an overlying position defining an overhang relative to said outwardly facing front surface of said lower door section in said lowered position of said door assembly, and a frame portion horizontally disposed between the front and rear surfaces of said upper door section and being secured thereto for supporting said front surface in the sloped position.

4,637,447

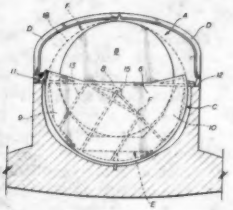
SUN SHIELD

Arthur M. Frank, Plainview; Silvio F. DeRespinis, Copiague, and John Mockovciak, Jr., Bayville, all of N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 12, 1985, Ser. No. 764,805

Int. Cl.[4] A47H *1/00*; B64G *1/58*

U.S. Cl. 160—265 **4 Claims**



1. A rectractable, self-deploying shading device adapted to selectively cover and uncover a subject area by moving a shading material from a compact storage position to an extended shading position comprising in combination:

an elongated, spring biased roller,

a flexible shading member adapted for winding on said roller and for unwinding therefrom,

at least one rotary member having an arcuate periphery adapted for guiding and continuously supporting said flexible shading member as said flexible shading member is selectively moved from an open, exposed unshading position to an extended, closed shading position,

means attached to the rotary member for drawing the shading member from the roller, and

a deployment means for rotating said rotary member.

4,637,448

METHOD FOR PRODUCTION OF COMBUSTION TURBINE BLADE HAVING A SINGLE CRYSTAL PORTION

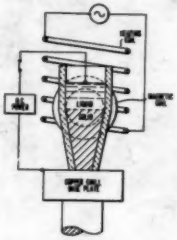
Michael A. Burke, Pittsburgh, and Cyril G. Beck, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1984, Ser. No. 644,751

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—122.2 **2 Claims**



1. In a process of fabricating directionally solidified turbine blades for combustion turbines of the type wherein a mold containing molten metal is cooled in a controlled fashion such that solidification occurs slow enough to allow single crystal growth beginning at the airfoil end, the improvement comprising:

monitoring said solidification and starting magnetic mixing of the remaining molten metal at approximately the beginning of solidification of said root section and adding grain boundary strengthening elements at approximately the same time that said magnetic mixing is started and then increasing the rate of cooling of said blade to a rate faster than at which directional solidification occurs, whereby a blade is produced with a single crystal airfoil section and a fine grained root section and without a substantially inhomogeneous portion at the interface between the airfoil and root sections.

4,637,449

COMPONENT CASTING

David Mills; Anthony T. Lindahl, and Alan D. Kington, all of Bristol, England, assignors to Rolls-Royce Limited, England

Continuation of Ser. No. 393,549, Jun. 30, 1982, Pat. No. 4,532,974. This application May 22, 1985, Ser. No. 737,280

Claims priority, application United Kingdom, Jul. 3, 1981, 8120598

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.[4] B22C *9/10*

U.S. Cl. 164—132 **13 Claims**

1. A method of casting a nickel- or cobalt-based superalloy component comprising the steps of:

(a) making a mold having a casting cavity in the shape of the component to be cast;

(b) locating a core within said casting cavity, said core comprising:

(i) a hollow member, said hollow member comprising two straight leachable ceramic refractory material portions interconnected by a bend; and,

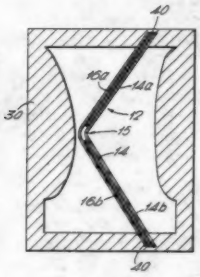
(ii) a ceramic support member, said ceramic support member comprising material of greater refractoriness than said material of said hollow member, wherein said support member comprises two straight portions extending into said hollow member from opposite ends thereof and terminating adjacent said bend, and wherein said support member is disposed within said hollow member

with a slight clearance therebetween sufficient only to allow for relative sliding between said support member and said hollow member.

(c) filling the mold with molten superalloy component material and allowing the superalloy component material to solidify; and,

(d) removing the core from the component by withdrawing said support member portions from opposite ends of said hollow member and subsequently leaching said hollow member from the component.

6. A core for use in a mold for casting nickel- or cobalt-based superalloy, said core defining a passage in a nickel- or cobalt-based superalloy casting component and comprising:



(a) a hollow member, said hollow member comprising leachable ceramic refractory material, wherein said hollow member comprises two straight portions interconnected by a bend; and,

(b) a ceramic support member, said ceramic support member comprising material of greater refractoriness than said material of said hollow member, wherein said ceramic support member comrpises two straight portion sextending into opposite ends of said hollow member the terminating adjacent said bend; and wherein said support member is disposed within said hollow member with a slight clearance therebetween sufficient only to allow for relative sliding between said support member and said hollow member.

4,637,450

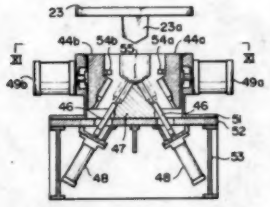
ENTIRELY AUTOMATIC, COLD BOX TYPE MACHINE FOR MOLDING AN INTEGRAL CONNECTING CORE

Kazuo Kawai, Toyonaka; Sumikazu Kawai, and Seiji Katashima, both of Amagasaki, all of Japan, assignors to Naniwa Products Co., Ltd., Japan

Division of Ser. No. 486,938, Apr. 20, 1983, Pat. No. 4,559,989. This application Feb. 26, 1985, Ser. No. 705,703

Int. Cl.⁴ B22C *15/22, 7/06*

U.S. Cl. 164—200 **4 Claims**



1. Split core boxes for an entirely automatic, old box type machine for molding an integral connecting core, which machine is provided with a sand blowing mechanism and a gassing mechanism, said mechanisms being suspended above an upper frame of the molding machine and traversable, and with a liftable drag car being mounted on a platform of the molding machine, characterized in that said core boxes consist of a combination of a drag core box having cavities for inserting the connecting cores and a cope core box having fixed mandrels at its lower surface and a plurality of blow ports, said drag core box consisting of a fixed pattern provided on a drag core box base, a pair of vise patterns which slide and engage with each other, a pair of loose pieces which slide perpendicular to the sliding direction of said vise patterns, and at least one mandrel around which molding takes place which passes through said drag core box base between said sliding vise patterns and pieces, and the assembly of said drag and cope core boxes is of such mechanism that it is opened or closed in a closed box.

4,637,451

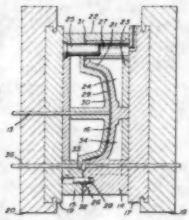
DIE CASTING MOLD

Guido Perrella, Westmount, Canada, and William E. Thompson, Middletown, Ind., assignors to DBM Industries Limited, Quebec, Canada

Filed Feb. 22, 1984, Ser. No. 582,632

Int. Cl.⁴ B22D *17/26*

U.S. Cl. 164—342 **7 Claims**



1. A die casting metal mold half for use in high pressure die casting comprising a front wall adapted to form a portion of a die cavity and incorporating a die casting area, side walls extending rearwardly from the front wall, a backing member, and means to fasten said backing member to said side walls, said front wall, side walls and backing member forming a high pressure heat exchange cavity, means for introducing heat exchange fluid under pressure into said high pressure heat exchange cavity and means for releasing fluid under pressure from said high pressure heat exchange cavity.

4,637,452

MOLD APPARATUS FOR CONTINUOUS CASTING SYSTEM

Takashi Kawakami, Nihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,560

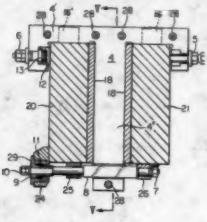
Claims priority, application Japan, Sep. 2, 1985, 60-193424

Int. Cl.⁴ B22D *11/04*

U.S. Cl. 164—420 **5 Claims**

1. A mold apparatus for use in a continuous casting system, having a pair of parallel longer frames disposed to oppose each other and lined at their opposing surfaces, and a pair of shorter frames disposed between opposing ends of said longer frames and lined at their opposing surfaces, said longer and shorter frames in cooperation defining a rectangular mold cavity, said mold apparatus comprising: a core frame disposed between the longitudinal centers of said longer frames such as to divide said mold cavity into two sections, said core frame being split into two segments in the thicknesswise direction and having a substantially T-shaped configuration constituted by a vertical portion disposed between said longer frames and projecting downwardly beyond the lower ends of said longer frames and

top wing portions projected laterally from the top end of said vertical portion and resting on the upper surfaces of said longer frames, said segments of said core frame being lined at their outer surfaces at at least said vertical portion; a core frame upper portion locating means disposed on the upper surfaces of said longer frames substantially at the longitudinal centers of said longer frames and adapted for releasably fixing said wing portions of said core frame; a tie rod detachably secured to the lower ends of said segments of said core frame projected downwardly beyond the lower ends of said longer frames, so as to extend parallel with said wing portions of said core frame;



a core frame lower portion locating means provided on the undersides of said longer frames substantially at the longitudinal centers of said longer frames and adapted for holding respective ends of said tie rod; upper tightening means for pressing said longer frames to the upper portions of both side edges of said vertical portion of said core frame; and a lower tightening means for pressing said longer frames onto both side edges of the lower portion of said vertical portion of said core frame; whereby said core frame is detachably secured between said longer frames, thereby permitting said mold apparatus to be used selectively either in a single or twin casting mode.

4,637,453

METHOD FOR THE CONTINUOUS PRODUCTION OF CAST STEEL STRANDS

Kenzo Ayata; Kiichi Narita, both of Kobe; Takasuke Mori, Ashiya, and Takahiko Fujimoto, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

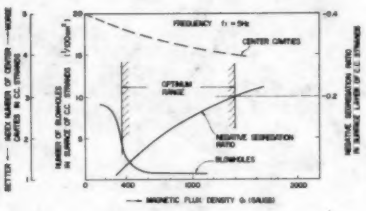
Continuation-in-part of Ser. No. 561,149, Dec. 14, 1983, Pat. No. 4,515,203, which is a continuation of Ser. No. 250,041, Apr. 1, 1981, abandoned. This application Aug. 21, 1984, Ser. No. 642,659

Claims priority, application Japan, Apr. 2, 1980, 55-43339; Apr. 2, 1980, 55-43341; Apr. 20, 1980, 55-43340

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] B22D *27/02, 11/16*

U.S. Cl. 164—468 **12 Claims**



1. A method for the continuous production of cast steel strands which are 200 mm×200 mm or less in cross-section by a continuous casting process in which molten steel containing 0.20% or less of carbon is fed into a casting mold with a lubricant and continuously drawn out downwardly of the casting mold, said method comprising the steps of:

(a) electromagnetically stirring the molten steel at a position within said casting mold by the application of a magnetic field induced by introducing into an electromagnetic coil an alternating current of a frequency (f) in the range of 1.5 to 15 Hz and maintaining the magnetic flux density in the range of $602\ e^{-0.10f}$ to $2441\ e^{-0.11f}$ gauss at the center of the electromagnetic coil, and

(b) electromagnetically stirring the molten steel at a position in the final solidfying zone of said continuously cast strands in which the shorter diameter of the molten steel pool is smaller than ½ the length of the shorter side of the cast strand, by the application of a magnetic field induced by introducing an alternating current having a freqency in the range of 50 to 60 Hz into an electromagnetic coil and maintaining the magnetic flux density in the range of $0.2 \cdot D^2 + 280$ gauss to $0.343 \cdot D^2 + 451$ gauss at the center of the electromagnetic coil, wherein D is the solidified shell thickness in millimeters of said continuously cast strands, the value of D ranging from 20 to 90.

4,637,454

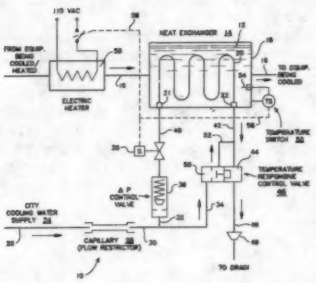
WIDE RANGE TEMPERATURE CONTROL SYSTEM FOR FLUIDS

Albert R. Lowes, Fremont, Calif., assignor to Mydax, Inc., Auburn, Calif.

Filed Apr. 1, 1985, Ser. No. 718,160

Int. Cl.[4] F25B *29/00;* **G05D** *23/00;* **B60H** *1/00;* **B61D** *27/00*

U.S. Cl. 165—36 **5 Claims**



1. A wide range temperature control system for controlling and maintaining the temperature of a first cooling liquid at a predetermined setpoint within a wide range of temperatures with the use of an indirect heat exchanger, a cooling coil in said exchanger for carrying a flow of a second cooling liquid from a supply for drawing off heat from said first cooling liquid, said system comprising:

flow restrictor means for limiting flow rate from said supply and providing a flow restricted output of said second cooling liquid,

primary flow means communicating between said output and an inlet of said cooling coil, said primary flow means including pressure control means for creating a constant back pressure, and a flow valve for controlling flow through said cooling coil,

bypass flow means communicating from said output through a flow control element of a temperature proportional control valve means to a junction with an outflow of said cooling coil, said junction being located upstream of a temperature sensitive chamber of said temperature proportional control valve means,

outflow means communicating from said junction through said temperature sensitive chamber to a discharge point for discharge of said second cooling liquid,

temperature sensor means including setpoint means for sens-

ing temperature of said first cooling liquid at its outflow from said heat exchanger, for receiving a preset setpoint temperature and for opening said flow valve when sensed outflow temperature is above a said setpoint and for closing said flow valve when sensed outflow temperature is below said setpoint,

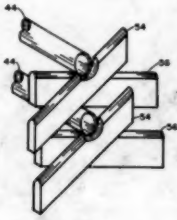
wherein said temperature proportional control valve means controls flow of second cooling liquid through said cooling coil by regulating the amount of bypass flow passing through its said flow control element in relation to temperature sensed in its said temperature sensitive chamber.

4,637,455

SUPPORT RACK FOR TUBES IMMERSED IN A FLUIDIZED BED

Sebastian Tordonato, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 28, 1984, Ser. No. 656,052
Int. Cl.[4] F28C 3/16; F28F 9/00
U.S. Cl. 165—104.16 **10 Claims**



1. In a fluidized bed having heat exchange surface in the bed having a plurality of tubes, a rack for supporting a tubular in-bed heat exchanger for transferring heat generated in the bed region of a fluidized bed to a working fluid passing through the tubular heat exchanger comprising:

(a) a plurality of spaced substantially parallel first members extending in a first direction and forming substantially a first plane, each of the plurality of first members are arcuately scalloped to accommodate a tube;

(b) a plurality of spaced substantially parallel second members extending in a second direction forming an angle with respect to the plurality of first members and forming substantially a second plane, the second plane spaced from and substantially parallel to the first plane, the intermember space as projected normal to the first and second planes being an opening having substantially a quadrangular shape formed by adjacent first members and adjacent second members for receiving a tube of the tubular heat exchanger, the tube of the heat exchanger received in the quadrangular shape opening engaging one of the members forming the quadrangular opening such that a portion of the weight of the tube is carried thereby; and

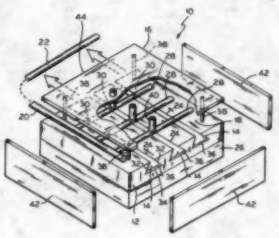
(c) a plurality of spaced third members extending substantially between the first plane and the second plane engaging the plurality of first members and the plurality of second members between adjacent tubes of the tubular heat exchanger, the weight carried by the plurality of first members and the plurality of second members transferred to the plurality of spaced third members and in turn transferred to a support therebeneath, whereby the plurality of first and second members form a criss-cross array with quadrangular openings therebetween through which the tubes of the tubular heat exchanger pass with a portion of the weight of each tube carried by one of the members of the criss-cross array the weight of each tube transferred to the criss-cross array and in turn carried to a support beneath the rack by the spaced third members.

4,637,456

HEAT EXCHANGER

Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1985, Ser. No. 812,841
Int. Cl.[4] H01L 23/46; F25C 1/00
U.S. Cl. 165—104.33 **19 Claims**



1. A heat exchanger, comprising:

a liquid impingement plate having a liquid carrying channel therein;

means for spraying a liquid into said liquid carrying channel;

a liquid containment plate disposed in spaced relation to said liquid carrying channel, said liquid containment plate and said liquid impingement plate defining a liquid flow chamber therebetween;

liquid inlet means in communication with said liquid spraying means to permit said liquid to flow through said liquid spraying means into said liquid carrying channel;

liquid outlet means in communication with said liquid flow chamber to permit said liquid to be removed from said liquid flow chamber; and

means for cooling said liquid impingement plate on the side thereof opposite said liquid flow chamber to a temperature at or below the freezing point of said liquid;

said liquid carrying channel including means for retaining a portion of said liquid in a frozen state there-within, said retaining means comprising a narrowed channel opening facing said liquid spraying means in spaced relation to said cooling means.

4,637,457

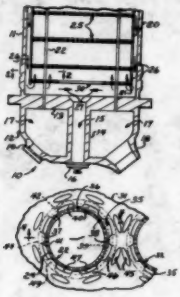
BAFFLE PLATE WITH EIGHT-LOBED TUBE-RECEIVING OPENINGS AND COLD-FORMED FLOW-RESTRICTING TABS IN EACH LOBE

Robert M. Wepfer, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 25, 1985, Ser. No. 695,036
Int. Cl.[4] F28F 9/22
U.S. Cl. 165—162 **20 Claims**

1. In a heat exchanger including a pressure vessel closed at one end by a tube sheet and a plurality of heat exchange tubes within the vessel extending into the tube sheet for heat exchange between a fluid flowing through the tubes and a liquid flowing around the tubes in a flow path extending generally parallel thereto, the improvement comprising: a baffle plate disposed within the vessel and extending transversely thereof in the liquid flow path adjacent to the tube sheet, said baffle plate serving to limit liquid flow parallel to the tubes and to redirect at least a portion of the flow generally parallel to the tube sheet, said baffle plate having parallel upper and lower surfaces and a plurality of tube-receiving openings extending therethrough substantially perpendicular to said upper and lower surfaces for respectively receiving said tubes, each of said openings having a circular central portion dimensioned freely to accommodate the associated tube and a plurality of peripheral lobe portions communicating with said central portion, said baffle plate having a plurality of surface portions cooperating to define said central portions of said openings and

being engageable with the associated tubes at the planes of said upper and lower surfaces, each of said lobe portions extending generally radially outwardly from said central portion for



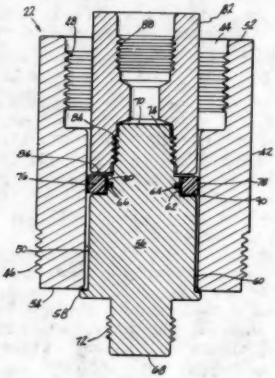
defining a flow channel alongside the associated tube, each of said lobe portions having a transverse cross-sectional area which varies between said upper and lower surfaces of said plate.

4,637,458

BLOWOUT PREVENTER FOR USE IN COMBINATION WITH A DEEP WELL PUMP

Gabriel D. Hernandez, Maracaibo-Edo. Zulia, Venezuela, assignor to Maraven, S.A., Caracas, Venezuela

Filed Jan. 10, 1986, Ser. No. 817,684
Int. Cl.[4] E21B *33/02, 33/06*
U.S. Cl. 166—68 **11 Claims**



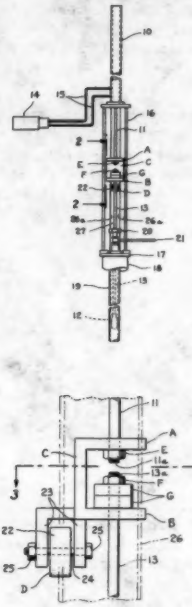
8. A coupling assembly for connecting a polished bar and rod string of a deep well pump comprising a hollow cylindrical nipple having a top and a bottom surface and a cylindrical bore of diameter D_1, a cylindrical mandrel partially received in said hollow cylindrical bore, said cylindrical mandrel having a first diameter portion D_2, a second diameter portion D_3 and a third diameter portion D_4 wherein D_3 is positioned between D_2 and D_4 and $D_2 > D_1 > D_3 > D_4$ such that said first diameter portion abuts the bottom surface of said nipple upon an inordinate increase of pressure in said well.

4,637,459

ANTI ROTATIONAL DEVICE FOR DOWN HOLE HYDRAULIC PUMPING UNIT

Louis J. Roussel, 1500 American Bank Bldg., New Orleans, La. 70130

Filed Jun. 28, 1985, Ser. No. 750,536
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—72 **7 Claims**



5. For use in a down hole pumping unit operated by a sucker rod driven by a hydraulic pump having a cylinder and cylinder rod, an anti rotational device for connecting said cylinder rod to said sucker rod while permitting rotation of the sucker rod comprising:

vertical spacer means connectable adjacent an upper end thereof in fixed relation to said cylinder rod;

means rotating said sucker rod;

means connecting said sucker rod adjacent a lower end of said vertical spacer means for rotation relative thereto; and

vertical guide means permitting vertical movement of said vertical spacer means while preventing rotation thereof.

4,637,460

PARALLEL FLOW TUBE APPARATUS

Jody R. McGlothen, Garland, Tex., and Damon P. Little, Bakersfield, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

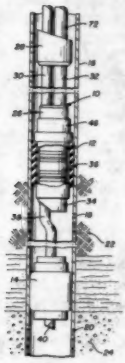
Filed Mar. 21, 1985, Ser. No. 714,588
Int. Cl.[4] E21B *33/122*
U.S. Cl. 166—189 **8 Claims**

4. An improved parallel flow tube comprising:

a coupling member having first and second generally parallel bores extending therethrough, each said bore being arranged to receive and connect a tubing member from one end and one said bore being arranged to receive and connect a tubing member from the other end of said coupling member;

an elongated seal sleeve having a first end sealingly con-

nected to said other end of said coupling member and extending therefrom terminating in a second end, said sleeve having a diameter sized to encompass both said bores; and



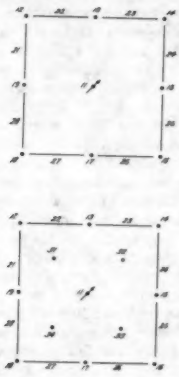
annular seal means encircling said sleeve between said first and second ends for forming a fluid-tight seal between said seal sleeve and a cylindrical member in which said sleeve may be disposed.

4,637,461

PATTERNS OF VERTICAL AND HORIZONTAL WELLS FOR IMPROVING OIL RECOVERY EFFICIENCY

Margaret A. Hight, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 30, 1985, Ser. No. 814,826
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—245 **16 Claims**



1. A method of recovering hydrocarbons from an underground formation by employing a modified inverted 9 spot well pattern, which comprises:

a substantially vertical central injection well;

four substantially vertical corner wells;

four substantially vertical side wells, each located between two corner wells; and

eight substantially horizontal production wells, each located between one of the side wells and one of the corner wells, said horizontal production wells extending from the ground surface and running a substantially horizontal distance within the hydrocarbon formation,

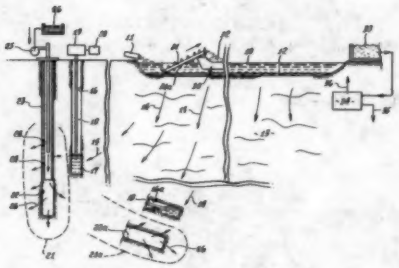
said horizontal wells aligned on the substantially rectangular boundaries of the modified inverted 9 spot running between the corner wells.

4,637,462

LIQUID MUD RING CONTROL OF UNDERGROUND LIQUIDS

Donovan B. Grable, #17 Seasons Ct., Madera, Calif. 93637

Filed Jun. 4, 1985, Ser. No. 740,986
Int. Cl.[4] E21B *33/138, 43/30, 47/00*; E02D *3/12*
U.S. Cl. 166—245 **20 Claims**



1. The method of controlling subterranean flow of contaminants draining from a zone of contaminant concentration, that includes

(a) determining the locus of flow of contaminants in a porous underground formation,

(b) drilling boreholes in the underground formation at selected locations about said zone of contaminant concentration,

(c) setting casing in the boreholes and cementing the casing in place,

(d) then forming through openings sidewardly through the casings at selected elevations in the boreholes, and in relation to said locus of contaminant flow,

(e) injecting into the formation via said through openings a substance that creates a barrier in the formation to said flow, to thereby establish a controlled height barrier to block said flow,

(f) said (a) step including drilling at least one test hole in the formation to a region or regions toward which contaminant flow is suspected, and testing the composition of the formation via said test hole or holes,

(g) said (b) and (c) steps including locating said boreholes containing said casing further from said zone than said test hole and drilling the boreholes deeper than contamination in the test hole.

12. Apparatus for controlling sub-terranean flow of contaminants draining or seeping into the earth from a zone of contaminant concentration, comprising

(a) first means for determining the locus of flow of contaminants in a porous underground formation, and

(b) second means for injecting into the formation a substance that creates a barrier in the formation to said flow, to thereby block said flow,

(c) said second means including multiple boreholes in the formation, and spaced about said zone at selected locations, casings set in said boreholes, multiple through openings extending sidewardly through walls defined by the casings and at selected elevations in the boreholes, said elevations being laterally of elevations of the contaminant flow,

(d) and said second means also including a source of said substance in mud form, and pump means pumping said

substance into said casings in the boreholes, under pressure, effecting its flow into the formation at elevations determined by the through openings in the casings, establishing a controlled height barrier of said substance, and including said barrier,

(e) and including said zone which is defined by a settling pond for contaminated water and which receives inflow of contaminants in water, and means removing settled contaminants from the bottom of the pond at a rate in relation to said inflow that contamination by escape of contaminants via subterranean flow, beyond the barrier, is substantially stabilized.

4,637,463

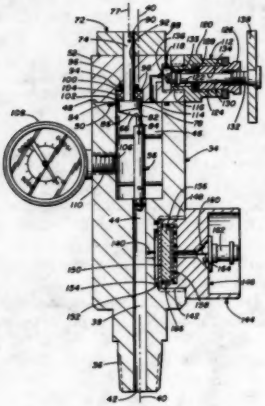
ECHO RANGING GUN

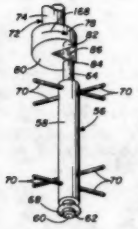
James N. McCoy, 5001 Ditto La., Wichita Falls, Tex. 76301

Filed Aug. 2, 1984, Ser. No. 636,992

Int. Cl.[4] E21B *47/04*

U.S. Cl. 166—250 **13 Claims**





1. A system for sensing the depth of a liquid gas interface in the wellbore, comprising:

a structure defining a volume chamber therein, said structure being adapted for connection to the well and said structure having a passage opening into the volume chamber at one end thereof and exposed to the wellbore gas pressure at the other end thereof when the structure is connected to the well;

a poppet valve positoned in said volume chamber and movable along a first axis between open and closed positions, the poppet valve having sealing means for isolating the passage and volume chamber to prevent gas flow therebetween when said poppet valve is in the closed position, said poppet valve permitting gas flow between the passage and the volume chamber in the open position;

mean for moving the poppet valve to the closed position and for rapidly releasing the poppet valve while in the closed position for movement to the open positions;

a bleed valve mounted in said structure in communication with said volume chamber and the atmosphere which is operable between open and closed positions to permit gas in the volume chamber to be released to the atmosphere in the open position to lower the pressure in the volume chamber while preventing gas flow from the volume chamber to the atmosphere in the closed position;

a microphone for sensing acoustic disturbances, said microphone being exposed to the gas pressure in the passage of said structure; and

the poppet valve initially being in the open position so that the pressure in the volume chamber equals the pressure in the wellbore, the poppet valve subsequently being moved to the closed position by said moving means and said bleed valve being open to reduce the pressure in the volume chamber a predetermined amount below the pressure in the wellbore, said means for moving subsequently rapidly releasing the poppet valve so that the pressure differential between the passage and volume chamber drives the poppet valve to the open position and generates an acoustic event for transmittal through the passage to the wellbore with reflective acoustic signals being transmitted from the wellbore through the passage to the microphone for sensing of the depth of the liquid gas interface;

the poppet valve comprising a shaft having a first end portion with an O-ring groove formed therein and a bearing surface at the second end portion of the shaft opposite the first end portion for contacting by said moving means;

an O-ring seal positioned in the O-ring groove, the O-ring sealing between the wall of the passage and the shaft when the poppet valve is in the closed position; and

a plurality of centering pins attached to said shaft and extending radially outwardly therefrom to guide the shaft and O-ring seal for movement along the first axis.

5. A system for sensing the depth of a liquid gas interface in a wellbore, comprising:

a body having a passage formed therein extending from one face to a region within said body, said passage being centered on a first axis and a volume chamber formed in an opposite face extending into the body and intersecting said passage, said volume chamber also being centered on the first axis;

a cap adapted for attachment to the body over the volume chamber and having a aperture therethrough centered on a second axis parallel the first axis but offset therefrom;

a poppet valve positioned in said volume chamber for movement along the first axis between closed and opened positions and having a gasket means at the end thereof proximate the passage for sealing the passage from the volume chamber in the closed position;

a poppet valve control having a member extending into the volume chamber defining a ramp surface thereon, said control being mounted through the aperture in said cap for rotation about the second axis, rotation of the control in a first direction causing the poppet valve to move to the closed position through contact between the ramp and poppet valve, further rotation of the control causing the poppet valve to be released from contact with the ramp for movement to the open position unrestricted by the control;

means for bleeding gas from the volume chamber; and

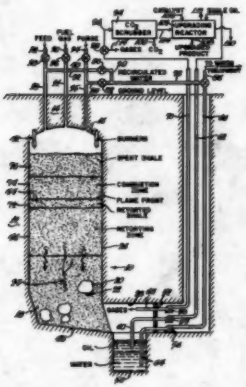
the system operating by permitting gas from the wellbore to enter the passage and volume chamber with the poppet valve open, subsequently rotating said control to close the poppet valve and bleeding sufficent gas from the volume chamber to provide a predetermined pressure differential between the passage and volume chamber and further rotating the control to permit the poppet valve to be driven to the open position to generate an acoustic event.

4,637,464

IN SITU RETORTING OF OIL SHALE WITH PULSED WATER PURGE

John M. Forgac, Elmhurst, and George R. Hoekstra, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill. and Chevron U.S.A., Inc.

Filed Mar. 22, 1984, Ser. No. 592,376
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—261 6 Claims



1. A process for retorting oil shale, comprising the steps of:

heating a portion of a rubblized mass of oil shale in a retorting zone of an underground retort to a retorting temperature to liberate shale oil and retort water from said oil shale leaving retorted shale containing residual carbon;

combusting said residual carbon in said oil shale in a combustion zone behind said retorting zone in said underground retort with a flame front fed by an oxgen-containing, combustion-sustaining, feed gas to provide a substantial portion of said heating, said flame front advancing generally in the direction of flow of said feed gas;

injecting a purge liquid comprising retort water in the absence of said oxygen-containing, combustion-sustaining, feed gas into said underground retort to quench said flame front while substantially stopping and blocking the flow of said oxygen-containing, combustion-sustaining, feed gas into said retort while simultaneously continuing to libcrate shale oil and retort water in said underground retort;

said retort water liberated from said retort and injected into said underground retort as said purge liquid, comprising raw, retorted and spent oil shale particulates ranging in size from less than 1 micron to 1000 microns, water, shale oil, phenols, organic carbon, ammonia, sodium, iron, sulfur, magnesium, calcium, nitrogen, nickel, copper, phosphorus, zinc, and arsenic;

reigniting said flame front with said oxygen-containing, combustion-sustaining, feed gas by feeding said oxgen-containing feed gas into said retort in the absence of said retort water purge liquid while simultaneoulsy substantially stopping and preventing the flow of said retort water purge liquid into said retort; and

withdrawing said liberated shale oil and retort water from said underground retort.

4,637,465

REMOVAL OF PHENOLS IN GROUNDWATER AFTER UNDERGROUND GASIFICATION OF COAL

Bruce W. Gash, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Filed Feb. 8, 1985, Ser. No. 699,773
Int. Cl.[4] E21B *43/243, 43/34*
U.S. Cl. 166—261 8 Claims

1. A method for removing phenols from an underground gasification zone after coal conversion is terminated, provided with at least one injection well and at least one production well comprising injecting into said zone through at least one well extending into said zone an aqueous alkali metal or ammonium hydroxide solution in an amount sufficient to convert at least a portion of the phenols present in said zone to the corresponding salt, said salt being more water soluble than the phenol, and producing from at least one well extending into said zone an aqueous solution of said salt.

4,637,466

METHOD OF IMPROVING CONFORMANCE IN STEAM FLOODS WITH CARBOXYLATE STEAM FOAMING AGENTS

Jeffrey T. Hawkins, and Vernon H. Schievelbein, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 3, 1986, Ser. No. 848,006
Int. Cl.[4] E21B *43/22, 43/24*
U.S. Cl. 166—272 11 Claims

1. A process for recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting steam into an injection well;

injecting into the injection well a mixture of steam, about 0.01 to about 5 thousand standard cubic feet of a non-condensable gas per barrel of steam in the injected mixture and about 0.01% to about 5% by weight of a foaming agent based upon the weight of the steam in the injected mixture,

said foaming agent represented by the formula,

$$RO(R'O)_nR''CO_2^-M^+,$$

where R is an alkyl radical, branched or linear, having from about 8 to about 24 carbon atoms in the alkyl chain, R' is ethylene, propylene or a mixture of ethylene and propylene, n has an average value of about 3 to about 11, R'' is methylene or ethylene, and M^+ is an alkali metal or ammonium ion;

injecting steam into said injection well; and

recovering hydrocarbons and other fluids from a production well.

4,637,467

PERMEABILITY CONTRAST CORRECTION

James E. Shaw, and John Westerman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 17, 1985, Ser. No. 755,750
Int. Cl.[4] E21B *33/13, 43/22*
U.S. Cl. 166—295 18 Claims

1. A method for permeability contrast correction operations involving in-situ polymerizaion to form water-insoluble polymers in remote subterranean areas which comprises

(1) injecting into high permeability subterranean strata an aqueous solution containing water-soluble monomers comprising a major amount up to 100 weight percent of at least one N-3-oxohydrocarbon-substituted acrylamide and the balance being at least one other monomer selected from alpha,beta-unsaturated amides, alpha,beta-unsaturated nitriles, vinyl-containing sulfonates and N-vinyl amides, and

(2) polymerizing said monomer(s) in the presence of a free

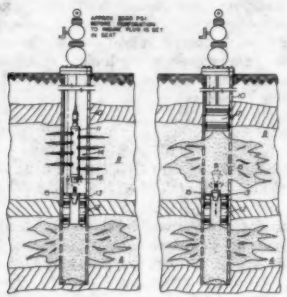
radical polymerization initiator to form water-insoluble polymers in-situ.

4,637,468

METHOD AND APPARATUS FOR MULTIZONE OIL AND GAS PRODUCTION

John M. Derrick, P.O. Box 396, Giddings, Tex. 78942

Filed Sep. 3, 1985, Ser. No. 771,588
Int. Cl.[4] E21B *43/14*
U.S. Cl. 166—297 **17 Claims**



1. A method for producing an upper formation and a lower formation in a well comprising;

penetrating said upper and lower formations with a casing,

cementing said casing in said well,

perforating said casing adjacent to said lower formation,

setting a first packer with a valve seat in said casing between said upper and lower formations,

lowering a setting tool assembly comprising a perforating gun having a plug releasably attached thereto into said casing,

setting said plug into said packer valve seat,

releasing said plug from said perforating gun,

pressuring said well sufficient to maintain said plug in said valve seat,

perforating said casing adjacent to said upper formation,

setting a second packer in said casing above said upper formation,

said plug being vertically movable relative to said valve seat by differential pressure between said upper and lower formations to allow said upper formation to be produced when said plug is closed and said lower formation to be produced when said plug is open, and

removing said plug from said well after the pressure in each formation has equalized allowing both formations to be produced by mechanical lift.

4,637,469

APPARATUS AND METHOD OF WELL PREPARATION FOR CHEMICAL TREATMENT OF PRODUCED FLUIDS

Dennis M. Spriggs, Dallas, and Jody R. McGlothen, Garland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 6, 1984, Ser. No. 637,671
Int. Cl.[4] E21B *41/02, 23/04*
U.S. Cl. 166—310 **18 Claims**

1. Apparatus for use on the lower end portion of a string of tubing located in the casing of a production well for chemical treatment of fluid pumped from the well through the tubing, comprising a tubing anchor having:

a tubular mandrel with upper and lower connectors adapted for connection within the tubing string,

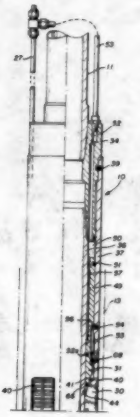
a tubular anchor cage concentrically spaced around said mandrel and connected to one of said connectors,

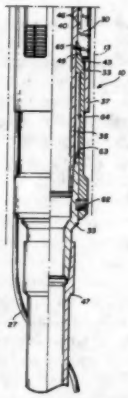
a plurality of slips angularly spaced from each other around said mandrel within said cage and being movable radially outward thereof to embed in the casing.

first and second spaced setting heads connected to said mandrel between said connectors with said slips being disposed between said setting heads and including axially spaced wedging surfaces,

pump means supported by said tubing for pumping fluid from the well upwardly through the mandrel and the tubing,

a collection chamber beneath said pump means and communicating therewith to receive the well fluid to be pumped upwardly through the tubing,





a chemical injection line connected to the outside of said tubing and including a lower outlet and adapted for communication with said collection chamber for injection of a treatment chemical into the well fluid before the latter passes through said pump, and

means associated with said setting heads for moving said wedging surfaces toward each other without tubing rotation to wedge against and drive said slips radially outwardly to embed within the casing in the well, said means including means for pumping a pressure fluid through said chemical injection line to set said slips.

17. A method for installation of well apparatus for chemical treatment of produced fluids comprises the steps of

lowering a tubing anchor to a selected position in a well with a collection chamber for a pump at the lower end of the well tubing extending into the well fluid to be produced,

connecting a chemical injection line to the side of the well tubing with an outlet of the injection line disposed within the collection chamber,

temporarily blocking the outlet of chemical injection line,

connecting the chemical injection line with a pressure chamber for setting slips of the tubing anchor above the blocked outlet of the chemical injection line,

pumping a pressure fluid through said chemical injection line and said branch line to at least initially set said anchor slips, thereafter,

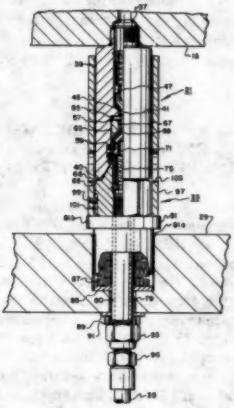
unblocking said blocked outlet, and

delivering an injection chemical through said injection line into the collection chamber to mix with the well fluid therein.

4,637,470
SUBSEA HYDRAULIC COUPLING

Gary G. Weathers, and Billy J. Rice, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 19, 1985, Ser. No. 747,081
Int. Cl.[4] E21B *33/038*
U.S. Cl. 166—344 **5 Claims**



1. In a hydraulic connector assembly of the type having first and second support members for carrying respectively a first connector and a second connector which telescopingly mate to form a hydraulic connection, each connector having an axial bore with a seat and a check valve member for movement between an open position when the connectors are in contact with each other, allowing hydraulic fluid flow, to a closed position when the connectors are apart from each other, blocking hydraulic fluid flow, the check valve members being urged into the closed position by spring means, the improvement comprising in combination:

metal seal means actuable by axial deflection and carried by one of the connectors for sealing the axial bores to each other;

an external flange located on the first connector;

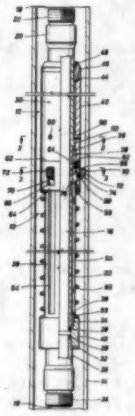
the first connector having conduit means extending through a hole in the first support member and adapted to be connected to a hydraulic fluid line for the delivery of hydraulic fluid, the first connector and conduit means being moveable in unison with each other and with respect to the first support member; and

bias means for urging the connectors together to maintain the seal means in axial deflection, the bias means comprising a plurality of frusto-conical washers encircling the conduit means between the flange and the first support member, so that when the support members are brought together, the first connector and the conduit means will move a slight distance relative to the first support member, deflecting the frusto-conical washers to apply a force to the connectors to maintain them tightly together.

4,637,471
TUBING DRAIN VALVE USEFUL WITH HEAVY, SAND-BEARING OIL

Paul B. Soderberg, Houston, Tex., assignor to Soderberg Research & Development, Inc., Houston, Tex.

Filed Apr. 30, 1985, Ser. No. 729,110
Int. Cl.[4] E21B *34/12*
U.S. Cl. 166—373 **28 Claims**



8. An apparatus suitable for conducting fluid through a conduit therein from a first to a second port and including means for producing a fluid passage through a wall of said apparatus to communicate said conduit with the exterior of said apparatus intermediate said ports, comprising:

a hollow body having a first section including said first port and a second section including said second port;

a valved fluid passage between the interior and the exterior of said hollow body through a wall of said hollow body intermediate said first and second ports;

means for engaging a surface of an object exterior of said hollow body for temporarily preventing movement of said first section in one direction along the longitudinal axis of said hollow body, said engaging means extending outwardly from said hollow body and being at least partially retractable within said fluid passage in its opened position so that said engaging means is disengaged from said surface and movement of said apparatus is permitted after said fluid passage is in its opened position; and

means for opening said valved passage in response to movement of said second section in said direction along the longitudinal axis of said hollow body while movement of said first section is prevented.

17. A method for opening an initially closed fluid communication passage through the sidewall of a device between the exterior of said device and a conduit suitable for conducting fluid from a first to a second end of said device, said device having first and second longitudinally movable sections, comprising the steps of:

extending engaging means outwardly from said device for temporarily preventing movement in one direction of said first section along the longitudinal axis of said device by engaging a surface of an object exterior of said device;

moving in said direction said second section of said device

along said longitudinal axis until said passage is opened; and

retracting said engaging means at least partially into said opened passage to permit movement of said device.

4,637,472

RAPID DISCHARGE EXTINGUISHER

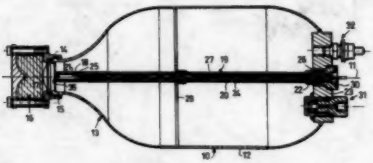
Frédy Decima, Le Plessis Robinson, France, assignor to ABG Semca, Paris, France

Filed Jun. 6, 1985, Ser. No. 741,919

Claims priority, application France, Jun. 8, 1984, 84 09034

Int. Cl.[4] A62C *35/08*

U.S. Cl. 169—35 **8 Claims**



1. Rapid discharge extinguisher comprising:

a container having a first axis enclosing a liquid inhibitor and a pressurized gas, the liquid inhibitor vaporizing when it expands, the container presenting, a revolution form adjacent to its outlet opening, the resolution form being developed by a rotation about the first axis of an arc of a circle, the center of the circle being located outside the container;

a through cover sealing the container at the outlet opening thereof, the cover being perpendicular to the first axis, no obstacle to the liquid inhibitor being provided near the through cover inside the container; and

explosive charge means for developing a shock wave, upon explosion, to shear the through cover, the explosive charge means being disposed inside the container adjacent to the through cover for causing the shock wave developed by the explosive charge means to travel along the first axis, thereby reducing to a minimum singular pressure drops in the container.

4,637,473

FIRE SUPPRESSION SYSTEM

Joseph P. Gillis, Westboro, and Norval M. Jess, Wrentham, both of Mass., assignors to Kidde, Inc., Saddle Brook, N.J.

Filed Jan. 16, 1986, Ser. No. 819,393

Int. Cl.[4] A62C *37/04*

U.S. Cl. 169—61 **20 Claims**

1. A fire suppression system comprising:

an enclosure for receiving particulate matter and defining an inlet opening and an outlet opening;

an input duct connected to said inlet opening;

air moving means for forcing air through said input duct into said enclosure, and out of said outlet opening;

inlet sensor means providing an inlet output signal dependent on the inlet temperature of combined gas and particulate matter entering said enclosure through said inlet opening;

outlet sensor means providing a discharge output signal dependent on the outlet temperature of air discharged through said outlet opening;

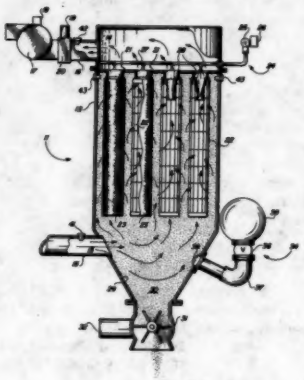
difference circuit means receiving said inlet and discharge output signals and providing a difference signal in response to a predetermined minimum difference therebetween;

a supply of fire extinguishing agent;

an actuator means operable to release said agent into said enclosure;

detector means for providing a detection signal in response to the presence of combustion products within said enclosure; and

control circuit means receiving said detection signal and said



difference signal; said control circuit means adapted to deactivate said air moving means in response to said difference signal and to activate said actuator means to release said agent in response to said detection signal.

4,637,474

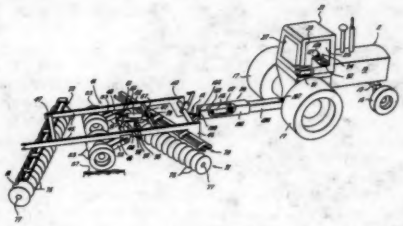
TRACTOR AND TOWED IMPLEMENT WITH ELEVATION CONTROL SYSTEM FOR IMPLEMENT INCLUDING PRESSURE RESPONSIVE VALVE ACTUATOR

Willie B. Leonard, 5902 Royalton, Houston, Tex. 77081

Continuation-in-part of Ser. No. 232,868, Feb. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 33,036, Apr. 29, 1979, Pat. No. 4,355,506, said Ser. No. 232,868, is a continuation-in-part of Ser. No. 828,045, Aug. 26, 1977, Pat. No. 4,227,440, which is a continuation-in-part of Ser. No. 772,560, Feb. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 622,760, Oct. 15, 1975, Pat. No. 4,094,229, which is a continuation-in-part of Ser. No. 521,036, Nov. 5, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Dec. 29, 1983, Ser. No. 566,755

Int. Cl.[4] A01B *63/112*

U.S. Cl. 172—7 **27 Claims**



8. Automotive apparatus comprising

a tractor,

a towed implement including a tool,

connection means connecting the implement to the tractor,

means including a hydraulic motor for adjusting the elevation of the tool relative to the earth's surface,

a source of hydraulic fluid under pressure,

a reservoir,

valve means for selectively connecting the motor to the source and reservoir,

hydraulic line means having a drooping pressure versus flow characteristic,

motive means responsive to the pressure in said line means for actuating the valve means,

operator controlled vent means carried by the tractor for varying the pressure in said line means,

negative feedback vent means connected to the tool for varying the pressure of said line means, upon movement of the tool in response to movement of the operator controlled vent means, to negate the effect of the change of the pressure of said line means caused by the operator controlled vent means,

wherein said operator controlled vent means and said feedback means connected to the tool are of like construction, each including a vent valve having a body with a cylindrical bore and diametrically opposed nozzle ports in the body and a generally cylindrical rotor rotatably mounted concentric with said bore and having an undercut eccentric cylindric land extending between said ports when the vent valve is in closed position, the space between said bore and said land being connected to the reservoir.

4,637,475

IN-THE-HOLE DRILL

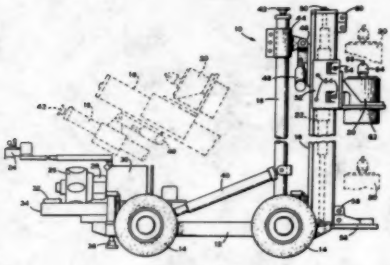
John R. England, and Richard L. Riach, both of Sudbury, Canada, assignors to Inco Limited, Toronto, Canada

Filed Jan. 23, 1984, Ser. No. 572,831

Claims priority, application Canada, Jan. 5, 1984, 444715

Int. Cl.[4] E21B *15/04*

U.S. Cl. 173—43 **10 Claims**



1. A mobile drilling apparatus, the apparatus comprising a frame, the frame having a distal end and a proximal end, a column pivotally mounted on the distal end of the frame, the column movable in a first arc substantially normal to the distal end of the frame, the first arc defined from a proximal lowered position to a distal upright vertical position, anchoring means disposed within the top of the column, a pivot assembly affixed on the distal end of the frame, a box frame mast supported by the column and affixed to the pivot assembly, the mast movable along the first arc in a fixed relationship with the column and along a second arc substantially normal to the first arc independently of the column, a concentric double acting cylinder mounted within the mast, a carrier slidably registered with the mast and ganged with the cylinder so as to move therewith, a stress relief trunnion engaging the cylinder, the stress relief trunnion mounted within a bracket disposed within the mast, the bracket affixed to the carrier, a drill motor affixed to the carrier, and means for securing the apparatus against movement.

4,637,476

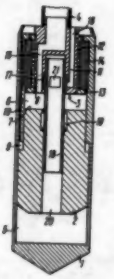
PERCUSSIVE ACTION MACHINE FOR MAKING HOLES IN THE GROUND

Konstantin S. Gurkov; Alexandr D. Kostylev; Gennady A. Tkachenko; Ivan P. Leonov, and Vladimir V. Klimashko, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Filed Apr. 4, 1985, Ser. No. 720,285

Int. Cl.[4] E21B *1/00*

U.S. Cl. 173—136 **5 Claims**



1. A percussive action machine for making holes in the ground, said machine comprising:

a cylindrical housing;

a hammer capable of reciprocations inside said housing;

a forward stroke chamber formed in said housing by said hammer;

an air-feeding line continuously communicating with said forward stroke chamber;

a return stroke chamber alternately communicating with said forward stroke chamber and with the outside;

a conduit means for communicating said return stroke chamber with said forward stroke chamber and with the outside, said conduit means positioned in said hammer;

a sleeve having an opening communicating with the outside, said sleeve secured in said housing;

a tubular control valve movable relative to said hammer and movable within and relative to said sleeve for opening and closing said opening in said sleeve to define with said sleeve an air-distributor;

a control valve moving means carried in said hammer for moving said tubular control valve to assume two extreme positions relative to said hammer, in one of which positions said return stroke chamber communicates through said conduit means in said hammer and through said valve in said air-distributor with the outside, whereas in the other extreme position said valve provides communication between said air feeding line and the forward stroke chamber;

said forward stroke chamber defined between end faces of said sleeve and said hammer;

said conduit means in the form of at least one bore provided in said hammer in line with its axis;

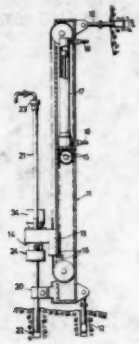
said tubular control valve communicating with said conduit means and extending through said forward stroke chamber;

at least one hole provided in the wall of said tubular control valve wherethrough said return stroke chamber communicates with said forward stroke chamber and with the outside.

4,637,477
DEVICE IN ROCK DRILLING MACHINES

Nils G. Jonsson, Täby, Sweden, assignor to Craelius AB, Marsta, Sweden

Filed Jan. 13, 1985, Ser. No. 696,924
Claims priority, application Sweden, Feb. 3, 1984, 8400574
Int. Cl.[4] B23Q 5/00
U.S. Cl. 173—149 12 Claims

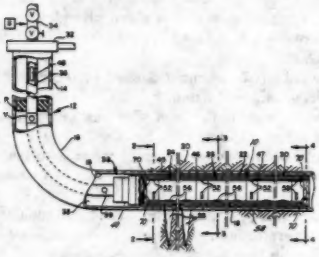


1. Device in rock drilling machines with a gripping device which is rotatably mounted in a non-rotating drilling head and intended to grip a drill string for transferring rotational and axial movements thereto, characterized in that the gripping device (24) is hydrostatically mounted (42, 43, 45–49) in the drilling head (14) whereby the pressure in a pressurized fluid between their coacting bearing surfaces (42, 43) automatically increases for increased loading pressure between these surfaces, the hydrostatic mounting including a chamber (38, 39) between coacting and mutually relatively rotating first surfaces on the gripping device and the drilling head, said chamber being supplied with pressurized fluid from a pressurized fluid source for further distribution to the bearing surfaces (42, 43), and also a variable constriction gap (49) proportional to the axial pressure on the drill string (21) in conjunction with coacting and mutually relatively rotating second surfaces on the gripping device and drilling head, the pressurized fluid being taken away from the bearing surfaces via said constriction gap.

4,637,478
GRAVITY ORIENTED PERFORATING GUN FOR USE IN SLANTED BOREHOLES

Flint R. George, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 436,075, Oct. 20, 1982, abandoned.
This application Aug. 7, 1985, Ser. No. 763,108
Int. Cl.[4] E21B 43/117
U.S. Cl. 175—4.51 11 Claims



1. A tubing conveyed perforating gun assembly for connection to a tubing string to enable the gun to be run downhole into a slanted borehole and detonated in order to perforate the wall of the borehole in a predominantly downward direction including:

a housing secured to said tubing string;

a charge carrier having a plurality of shaped charges therein oriented to fire in a pattern encompassing less then 180 degrees;

a gun firing head connected to detonate the shaped charges of the charge carrier;

means for actuating the gun firing head; and

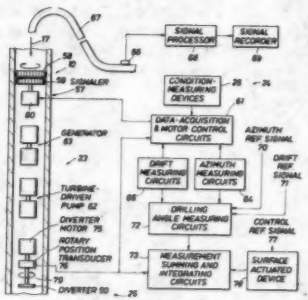
spaced journal means supporting said charge carrier in low friction relationship relative to the housing;

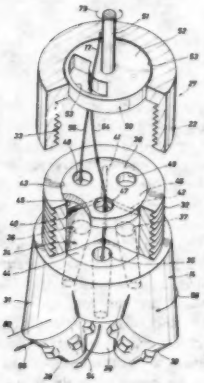
wherein the center of gravity of said charge carrier is displaced from the axis of said journal means in the direction of said firing pattern to cause said shaped charges to gravitate into a position which orients the charges predominantly downwardly so that the penetration, when the charges are detonated, occurs in a downward direction and said charge carrier is received within the housing which, in turn, isolates said charge carrier and said journal means from the wellbore.

4,637,479
METHODS AND APPARATUS FOR CONTROLLED DIRECTIONAL DRILLING OF BOREHOLES

Lawrence J. Leising, Rosenberg, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 31, 1985, Ser. No. 740,110
Int. Cl.[4] E21B 7/08
U.S. Cl. 175—26 22 Claims





1. Apparatus adapted for controlling the direction in which a borehole is being excavated and comprising:

a body adapted to be coupled to rotatable earth-boring apparatus and dependently supported in a borehole from a tubular drill string in which a drilling fluid is circulating;

first means cooperatively arranged on said body and adapted for dividing a drilling fluid circulating in a tubular drill string supporting said body into at least two fluid streams to be respectively discharged from rotating earth-boring apparatus coupled to said body and into angularly-spaced sectors of a borehole being excavated; and

second means cooperatively arranged on said body and adapted upon rotation of a rotatable earth-boring apparatus coupled to said body to be either selectively operated for sequentially discharging each of such fluid streams into at least two angularly-separated borehole sectors to direct said body along a first course of excavation or selectively operated for sequentially discharging each of such fluid streams into only a single borehole sector to direct said body along a second course of excavation.

15. A method for selectively excavating an inclined borehole with rotatable earth-boring apparatus suspended from a tubular drill string having a drilling fluid circulating therethrough, said earth-boring apparatus having a plurality of fluid passages respectively arranged therein for discharging a stream of said drilling fluid into an adjacent sector of said inclined borehole as said earth-boring apparatus is being advanced, and comprising the steps of:

determining the azimuthal direction and angular inclination in which said earth-boring apparatus is advancing in said inclined borehole;

whenever said earth-boring apparatus is advancing in a selected azimuthal direction, discharging said drilling fluid in a controlled sequence from each of said fluid passages as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into angularly-separated sectors of said inclined borehole to advance said earth-boring apparatus further in said selected azimuthal direction as it continues to excavate said inclined borehole;

whenever said earth-boring apparatus is advancing at a selected angular inclination, discharging said drilling fluid in a controlled sequence from each of said fluid passage as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into angularly-separated sectors of said inclined borehole to advance said earth-boring apparatus further at said selected angular inclination as it continues to excavate said inclined borehole;

whenever said earth-boring apparatus is not advancing in said selected azimuthal direction, discharging said drilling fluid in a controlled sequence from each of said fluid passages as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into only a single selected sector of said inclined borehole to divert said earth-boring apparatus toward said selected azimuthal direction as it continues to excavate said inclined borehole; and

whenever said earth-boring apparatus is not advancing at said selected angular inclination, discharging said drilling fluid in a controlled sequence from each of said fluid passages as said earth-boring apparatus is rotating for selectively directing said streams of drilling fluid into only a single selected sector of said inclined borehole to divert said earth-boring apparatus toward said selected angular inclination as it continues to excavate said inclined borehole.

4,637,480

AZIMUTH MEASURING METHOD FOR NON-VERTICAL DRILLING

Georges Obrecht, Seyssins, and Claude Dreuilhe, Saint Ismier, both of France, assignors to Alsthom, France

Filed Sep. 9, 1985, Ser. No. 773,728

Claims priority, application France, Sep. 7, 1984, 84 13764

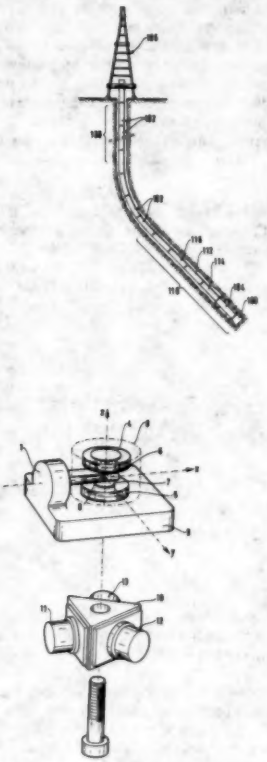
Int. Cl.[4] E21B 7/06

U.S. Cl. 175—45 **10 Claims**

1. Azimuth measuring method for non-vertical drilling using a tool disposed at the lower end of a drill pipe string consisting of a succession of drill pipes and which transmits force and rotates during drilling, comprising the operations of:

producing a gravitational phase reference signal using a member responsive to gravity and a rotating system disposed in a tubular section of the drill pipe string constituting a measuring section and having an axis locally coincident with the drill-hole, this signal being synchronized to the angular position of said system relative to the vertical plane through said axis,

producing by means of a member fastened to said rotating system and responsive to the ambient magnetic field in said section a magnetometric signal synchronized to the angular position of said system relative to said ambient magnetic field, said section consisting of a non-magnetic material so that said ambient magnetic field is not excessively different to the local terrestrial magnetic field,



measuring the phase of said magnetometric signal relative to said gravitational phase reference signal to produce a phase indication, and

using the result of this measurement to determine the azimuth of the measuring section axis relative to magnetic north, in which method:

said gravitational phase reference signal and said magnetometric signal are produced while said drill pipe string is rotating, so as not to interrupt drilling, rotation of said drill pipe string rotating said measuring section which rotates about its axis and constitutes said rotating system,

said drill pipes are of ferromagnetic steel on either side of said measuring section so as to combine low cost with high mechanical strength and to be magnetized by the local terrestrial magnetic field and create in said measur-

ing section a parasitic induced magnetic field, means such as the tubular shape of the ferromagnetic steel drill pipes for cancelling any component of said parasitic induced magnetic field perpendicular to the axis of said measuring section, and wherein said operation of producing said magnetometric signal entails measuring at least one component of said ambient magnetic field along a magnetometric axis associated with said section and perpendicular to its axis to determine variations in said component in order to provide at least one magnetometric signal which is independent of said induced magnetic field and which is independent of the field of any permanently magnetic parts in said measuring section and which alternates at the period of rotation of said drill pipe string, said method further comprising the steps of:

measuring the angle of inclination of the axis of said measuring section relative to the vertical to provide an inclination indication representative of this angle, and

combining said phase indication and said inclination indication with a predefined magnetic field inclination indication representative of the inclination of the terrestrial magnetic field at the drilling site to produce an azimuth indication representative of the angle between the vertical plane through the axis of said measuring section and the vertical plane of the terrestrial magnetic field.

4,637,481

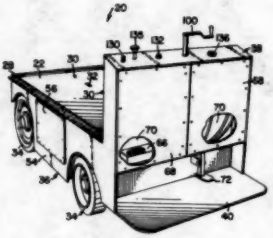
SELF-PROPELLED SCALE TESTING VEHICLE

Roger E. Shoemaker, Rt. 1, Box 87, Webster, S. Dak. 57274

Continuation of Ser. No. 552,671, Nov. 17, 1983, abandoned. This application May 7, 1986, Ser. No. 861,632

Int. Cl.⁴ G01G *19/52*

U.S. Cl. 177—50 **7 Claims**



1. A self propelled test weight vehicle for calibrating a weighing scale having a weighing scale deck with a width of substantially ten feet or more; said test weight vehicle comprising:

(a) a platform supported above the surface of the ground by four wheels, said platform including a generally horizontal top surface portion, a plurality of calibration weights of varying sizes, said platform being configured for supporting varying numbers and sizes of said calibration weights, a rail structure being positioned about a major portion of the perimeter of said platform for retaining said calibration weights, the test weight vehicle having a wheel base width of less than one-third the width of the weighing scale deck whereby corners of the weighing scale deck can be calibrated;

(b) a DC motor interconnected to the front two wheels on said platform by a direct drive mechanism;

(c) a DC battery power supply electrically interconnected to said DC motor and providing power to said DC motor;

(d) a mechanical brake assembly interconnected to said direct drive mechanism, said brake assembly including a drum and a shoe assembly;

(e) a mechanical steering mechanism interconnected to the back two wheels, said steering mechanism including a chain and sprocket assembly;

(f) an operator platform provided proximate the back end of the vehicle;

(g) operator controls for braking and steering positioned proximate the back end of the vehicle within easy reach of the operator; and

(h) compartment being provided within said vehicle adapted for receipt of varying amounts of weight, the test weight vehicle itself having a substantially constant weight which can be changed by addition or deletion of the calibration weights whereby the test weight vehicle itself need not be calibrated each time it is used to calibrate a weighing scale.

4,637,482

HYDRAULIC SYSTEM IN WORKING VEHICLES

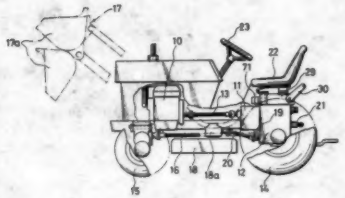
Ryota Ohashi, Sakai; Masahisa Kawamura, and Jiro Shibata, both of Amagasaki, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

Filed Feb. 10, 1986, Ser. No. 827,952

Claims priority, application Japan, Mar. 29, 1985, 60-46488[U]

Int. Cl.⁴ B62D *5/08*

U.S. Cl. 180—132 **4 Claims**



1. In a working vehicle comprising a hydraulic power steering mechanism, including a power cylinder, and a hydraulic lift mechanism including a lift cylinder, said power cylinder and said lift cylinder being powered by a single pump driven by engine, a hydraulic system comprising:

a flow control valve means (47) having an inlet port (48) connected to said pump (43) via a fluid supply path (44), a first outlet port (49) connected to said power cylinder (25) and a second outlet port (50) connected to said lift cylinder (31), said control valve means including therein an orifice (51) incorporated between said inlet port and said first outlet port and a relief valve (52) incorporated between said inlet port and said second outlet port,

said relief valve being fashioned such that, while fluid pressure in the upstream thereof is applied against biasing of a valve spring (53) thereof as a pilot pressure, fluid pressure in the downstream of said orifice is applied as another pilot pressure opposing said pilot pressure so that inflow flowing into said inlet port is divided into a constant flow directed towards said power cylinder through said first outlet port and a surplus flow in excess of said constant flow directed towards said lift cylinder through said second outlet port, said constant flow being determined by the flow area of said orifice and by the biasing force of said valve spring;

a piston (54) disposed coaxially with said valve spring (53) of said relief valve (52) and receiving the base end of said valve spring, said piston being movable axially within a predetermined range so as to vary the biasing force of said valve spring; and

another orifice (55) incorporated in said fluid supply path (44) between said pump (43) and said flow control valve means (47),

fluid pressure in the upstream of said another orifice being applied to said piston (54) so as to urge said piston towards said valve spring (53) and fluid pressure in the

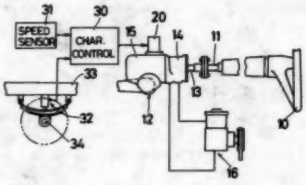
downstream of said another orifice being applied to said piston so as to urge said piston away from said valve spring, flow area of said another orifice being preset so that said piston is moved from its one end position to its another end position by pressure differential caused across said another orifice within a predetermined low speed range of said pump (43).

4,637,483

STEERING CHARACTERISTIC CONTROLLER FOR A POWER STEERING SYSTEM

Kunihiko Eto, Toyota; Shigeo Iwashita, and Tsutomu Matsumoto, both of Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 22, 1985, Ser. No. 800,724
Claims priority, application Japan, Nov. 23, 1984, 59-248308; Dec. 6, 1984, 59-258800
Int. Cl.[4] B62D 5/06
U.S. Cl. 180—142 10 Claims



1. A steering characteristic controller for a power steering system wherein an actuator is provided for varying the characteristic of an assisting power generated by a power steering gear, and wherein the electric current applied to said actuator is varied based upon both of a vehicle speed signal from vehicle speed sensing means and a vehicle load signal from vehicle load sensing means indicative of one of weight ranges of the weight of a load carried by the vehicle so as to control the operation of said actuator, said controller comprising:

signal converting means responsive to said vehicle speed signal from said vehicle speed sensing means for converting said vehicle speed signal into a signal corresponding thereto;

gain adjusting means responsive to said vehicle load signal from said vehicle load sensing means for varying the output gain of said signal output from said signal converting means in corresponding to the magnitude of said vehicle load signal;

wherein said gain adjusting means comprises:

an additional signal generator for generating an additional signal whose magnitude varies in a predetermined cycle;

a signal synthesizer for synthesizing said vehicle load signal from said vehicle load sensing means with said additional signal from said additional signal generator; and

conversion coefficient adjusting means responsive to a synthesized signal from said signal synthesizer for adjusting the conversion coefficient of said signal coverting means so as to enable said voltage signal from said signal converting means to vary in a stepped manner; and

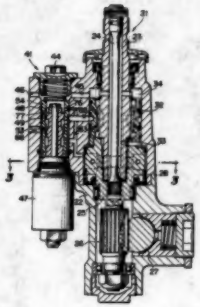
drive circuit means connected to said actuator for driving the same in response to said signal from said signal converting means.

4,637,484

HYDRAULIC CONTROL APPARATUS FOR A POWER STEERING DEVICE

Waichiro Ijiri, Osaka, and Shuzo Hirakushi, Nara, both of Japan, assignors to Koyo Jidoki Kabushiki Kaisha, Nara, Japan

Filed Apr. 22, 1985, Ser. No. 725,422
Claims priority, application Japan, Apr. 20, 1984, 59-79867
Int. Cl.[4] B62D 5/08
U.S. Cl. 180—142 12 Claims



1. A hydraulic control apparatus for a handle steering force control system of an automobile having a power steering device for assisting a steering force of the steering handle by a pressurized fluid from a fluid pump and a hydraulic reaction chamber for applying a force opposite the steering force of the steering handle to the steering handle by the pressurized fluid, the hydraulic control apparatus comprising:

a valve case having an inlet connected to the fluid pump, a return outlet connected to a fluid tank, a reaction outlet in communication with the hydraulic reaction chamber, a main valve outlet in communication with a main valve of the power steering device, and a resilient member provided at an end portion of the valve case;

a main spool slidably inserted into the valve case and biased in an axial direction of the valve case by the resilient member and having a first bore in communication with the inlet, a second bore in communication with the reaction outlet, a third bore in communication with the main valve outlet, variable communicating means for selectively connecting the reaction outlet and the return outlet, and an inner peripheral valve surface;

a sub-spool slidably inserted into the main spool and axially movable with respect to the main spool in response to a vehicle speed and having an outer peripheral valve surface, oil passages defined by the inner peripheral valve surface and the outer peripheral valve surface, and operative to variably open the oil passages by relative displacement between the inner and outer peripheral surfaces and to place the first bore in selective communication with the second bore or the third bore;

drive means for axially moving the sub-spool with respect to the main spool in response to the vehicle speed and operative when the vehicle speed is below a certain value to enable the oil passages to connect the first bore and the third bore whereby the fluid from the fluid pump is supplied to the main valve and to enable the variable communicating means to connect the reaction outlet and the return outlet whereby the fluid in the hydraulic reaction chamber is fed to the return outlet, and operative when the vehicle speed is above the certain value to enable the oil passages to connect the first bore and the second bore and to enable the variable communicating means to disconnect the reaction outlet and the return outlet whereby the fluid from the fluid pump is supplied to the reaction

chamber so as to increase the reaction pressure thereof; and

the main spool being responsive to the reaction pressure in the oil passages and movable against the biasing force of the resilient member when the reaction pressure reaches a predetermined value for enabling the variable communicating means to connect the reaction outlet and the return outlet.

4,637,485

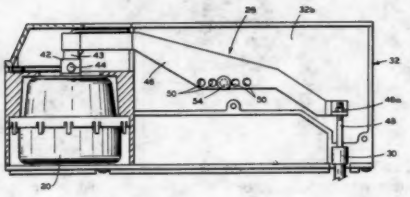
ADJUSTABLE THROTTLE CONNECTOR FOR A VEHICLE SPEED CONTROL UNIT

Jack O. Otteson, Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 603,494, Apr. 24, 1984, abandoned. This application Mar. 15, 1985, Ser. No. 712,542

Int. Cl.⁴ B60K *31/06*

U.S. Cl. 180—175 **15 Claims**



1. A speed control unit for controlling the actual speed of a vehicle at a desired speed, the vehicle including an engine having a throttle movable in two directions to increase and decrease the speed of the vehicle, comprising:

means for generating a signal representing the desired speed of the vehicle;

means for generating a signal representing the actual speed of the vehicle;

means responsive to said desired speed signal and said actual speed signal for moving a movable member in a speed increasing direction when the actual speed of the vehicle is less than the desired speed;

means connected between said movable member and the vehicle engine throttle for imparting movement of said movable member to the vehicle engine throttle, said connector means being connected at a first end to said movable member and at a second end to the vehicle engine throttle and including a pivot point disposed between said first and second ends about which said connector means is adapted to pivot; and

means for adjusting the point about which said connector means pivots without shifting said first and second ends relative to said movable member and the vehicle engine throttle, respectively.

4,637,486

AIR INTAKE SYSTEM AND COOLING SYSTEM RELATION FOR THREE-WHEELED MOTOR VEHICLE WITH RIDING SADDLE

Kazuhiro Iwai, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 772,091

Claims priority, application Japan, Sep. 3, 1984, 59-184068

Int. Cl.⁴ B60K *13/02*; B62D *61/08*

U.S. Cl. 180—225 **5 Claims**

1. A three-wheeled vehicle with a riding saddle comprising:

a frame including

a head pipe, and

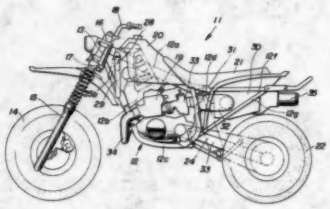
a main pipe extending rearwardly from said head pipe and having a hollow passage therethrough;

said main pipe having air inlet and outlet means on front and rear ends thereof for supplying air into and discharging air from the said hollow passage;

one front wheel and two rear wheels mounted on said frame;

a seat disposed on said main pipe;

an air cleaner connected to said air outlet means below said seat;



an air guide member disposed on one side of said front end of said main pipe for introducing external air into said air inlet means, said air guide member extending in a longitudinal direction of said vehicle;

a water-cooled engine mounted on said frame; and

a radiator disposed on an opposite side of said front end of said main pipe and connected for cooling said water-cooled engine.

4,637,487

TRACTION CONTROL DEVICE OF A MOTOR VEHICLE

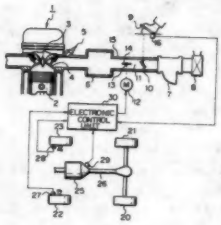
Kazumasa Nakamura, Okazaki; Ikuya Kobayashi; Takahiro Nogami, both of Toyota; Akira Shirai, Toyoake; Yoshihisa Nomura, Toyota, and Kaoru Ohashi, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 3, 1985, Ser. No. 771,774

Claims priority, application Japan, Sep. 3, 1984, 59-184768

Int. Cl.⁴ B60K *27/00*

U.S. Cl. 180—197 **20 Claims**



1. A traction control device for a motor vehicle having a plurality of wheels including at least one drive wheel, and an internal combustion engine having an intake passage and connected to said driven wheel for driving said driven wheel, said device comprising:

a manually operated throttle valve adapted to be coupled in said intake passage;

detecting means adapted for detecting a speed of rotation of said driven wheel and providing an output signal corresponding thereto;

a flow control valve adapted to be coupled in said intake passage in series with said manually operated throttle valve;

drive means for driving said flow control valve; and

electronic control means, coupled to said detecting means and said drive means, for controlling a flow area of said flow control valve in response to said output signal of said detecting means to cause the speed of rotation of said driven wheel to approach a desired speed of rotation at

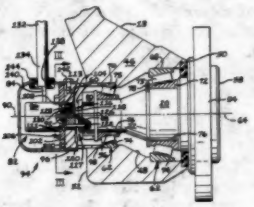
which a frictional force between said driven wheel and the ground reaches a maximum, when the speed of rotation of said driven wheel deviates from said desired speed of rotation during a time of acceleration of the motor vehicle.

4,637,488

AXLE ASSEMBLY

James R. Fotheringham, Willowick, and David L. Morrow, S. Euclid, both of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Sep. 12, 1985, Ser. No. 775,191
Int. Cl.[4] B60K *17/30*; B60T *8/00*
U.S. Cl. 180—253 **17 Claims**



1. An axle assembly, comprising:
a housing;
an output member having a first end and being rotatably connected to said housing;
a support bracket having first and second end portions and being connected at said first end portion to the first end of said output member, said second end portion having first and second spaced apart sides, and a bore opening at said sides;
a wheel;
a spindle having first and second end portions and a longitudinal spindle axis extending between said spindle end portions, said spindle being mounted in said bore and rotatable about said spindle axis, said spindle first end portion being connected to said wheel;
a sensor having a body and an input shaft rotatably connected to said body, said input shaft having a longitudinal axis;
means for connecting the sensor body to the second end portion of the support bracket at a location adjacent the second end portion of the spindle and maintaining the axis of the input shaft within a preselected range of axially aligned positions with respect to the axis of the spindle; and
means for coupling the second end portion of the spindle to the input shaft and transferring rotational motion from the spindle to the input shaft, said coupling means including a drive portion connected to said input shaft and engageable with said spindle, said drive portion being axially and radially movable relative to the spindle second end portion.

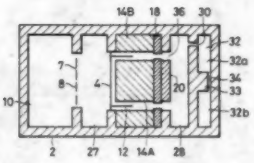
4,637,489

ELECTROACOUSTIC TRANSDUCER

Masaya Iwanaka, Kanagawa, and Seiji Kajiwara, Tokyo, both of Japan, assignors to Nippon Chem-Con Corp., Tokyo and Hideo Koide, Aichi, both of, Japan

Filed Sep. 4, 1985, Ser. No. 772,535
Claims priority, application Japan, Sep. 4, 1984, 59-185694
Int. Cl.[4] G10K *13/00*
U.S. Cl. 181—160 **4 Claims**

1. An electroacoustic transducer comprising:
a diaphragm having a front side and a rear side;
a front air chamber provided on the front side of the diaphragm, said diaphragm vibrating upon receiving sound waves and producing sound waves upon vibration, said front air chamber having first through holes positioned at a first end thereof;
a back air chamber, provided on the rear side of said diaphragm and behind said front air chamber, said back air chamber being formed integrally with said front air chamber, said back air chamber being communicated with said front air chamber via said first through holes, said back air chamber having second through holes at a rear end thereof; and



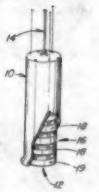
an auxiliary air chamber, provided in the rear of said back air chamber and which communicates with said auxiliary air chamber by said second through holes, said auxiliary air chamber being divided into first and second smaller air chamber, said second smaller air chamber not being communicated with said back air chamber, but being communicated with said first smaller air chamber by a small orifice, said auxiliary air chamber including a bridge extending from one wall of said auxiliary air chamber toward an opposing wall to form said small orifice.

4,637,490

JELLYFISH ARRAY

Clifford F. J. Oxner, Halifax, Canada, assignor to Her Majesty the Queen in Right of Canada, Ottawa, Canada

Filed Oct. 8, 1985, Ser. No. 785,539
Claims priority, application Canada, Apr. 11, 1985, 478941
Int. Cl.[4] G10K *11/00*; H05K *5/00*
U.S. Cl. 181—175 **9 Claims**



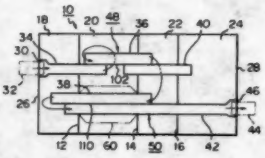
1. An acoustic array comprising:
a container with an open bottom;
means for suspending the container;
a plurality of transducer elements positionable in a stowed condition wherein the elements are stacked inside the container, and a deployed condition in which the elements are spaced apart in a column depending from the container;
spacer means joining each adjacent pair of transducer elements to limit the separation of the adjacent elements in the deployed condition and joining the uppermost of the transducer elements to the container to limit the separation of the uppermost transducer element from the container; and
control means secured to the bottommost of the transducer elements and extending therefrom for raising and lowering the bottom most transducer element between its stacked and deployed conditions while sequentially stacking or deploying the remaining transducer elements.

4,637,491

MUFFLER FOR INTERNAL COMBUSTION ENGINE AND METHOD OF MANUFACTURING TUBES FOR USE THEREIN

Masuo Fukuda, Omiya, Japan, assignor to Sankei Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1985, Ser. No. 746,260
Claims priority, application Japan, Jun. 21, 1984, 59-127766
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—265 9 Claims



1. A muffler for use in an internal combustion engine comprising:

an enclosure generally cylindrical and having end plates for closing the internal volume of said enclosure;

at least one partition plate for dividing the internal volume of said enclosure into at least two chambers;

an inlet tube, supported by both one of said end plates and at least one partition plate, for conducting combustion gases supplied from the engine to one of said chambers;

an outlet tube, supported by both the other of said end plates and at least one partition plate, for blowing out the gases from remaining one of said chambers; and

a connecting tube supported by said at least one partition plate for interconnecting the volume of adjacent ones of said chambers;

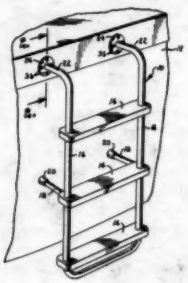
at least two of said inlet, outlet and connecting tubes being integrally made of a single sheet of metal shaped to form a combination tube including said at least two tubes.

4,637,492

LATCH MECHANISM FOR BOAT ACCESSORIES

Richard W. Herr, 1580 52nd St., Marathon, Fla. 33050

Filed Dec. 30, 1985, Ser. No. 814,557
Int. Cl.[4] B63B *29/20*; E06C *5/24*
U.S. Cl. 182—93 20 Claims



1. A latch mechanism for securing a boat accessory to a boat, said latch mechanism comprising:

a latch plate presenting a socket having a wall and an open end;

means for securing said latch plate to the boat;

a latch surface in said socket facing generally away from the open end thereof;

a tube extending from the accessory and having a tube wall terminating in an open end of the tube, said tube wall having a size and shape to closely enter the socket;

a pair of opposing latch elements carried in said tube and each having a head projecting beyond the end of the tube and presenting a shoulder for latching engagement with said latch surface;

means for mounting said latch elements to the tube for movement between a latching position and a release position, said shoulders being engageable with said latch surface in the latching position to latch the tube in the socket and said heads being passable through said socket in the release position;

yieldable means for urging said latch elements toward the latching position; and

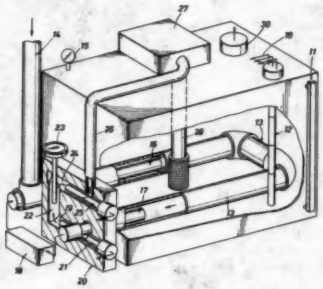
a release element projecting from each latch element through the tube wall, said release elements being accessible to effect movement of the latch elements to the release position.

4,637,493

MIST GENERATORS

Charles W. Ehlert, Katy, Tex., assignor to Lubricating Systems Company of Texas, Inc., Houston, Tex.

Filed Apr. 17, 1981, Ser. No. 255,238
Int. Cl.[4] F01M *1/08, 5/00*
U.S. Cl. 184—55.1 6 Claims



1. An oil mist lubricating system comprising:

an enclosed air-oil admixing reservoir containing liquid oil and having a mist exit opening disposed above the normal surface level of liquid oil in said reservoir;

mist generating means for admixing heated oil from said reservoir and heated air to provide an oil mist in said reservoir, said mist generating means being disposed in said reservoir above the normal surface of oil in said reservoir;

supply tube means for supplying liquid oil within said chamber to said mist generating means;

air flow conduit means which includes a conduit disposed in said chamber so as to be normally submerged in the oil when liquid oil is in said chamber, said conduit being constructed to transfer heat by convection to the liquid oil,

said air flow conduit means having an input constructed and arranged for connection to a source of air under pressure,

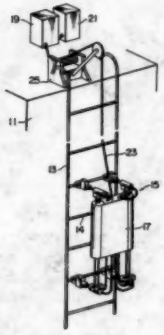
heater element means disposed within said air flow conduit of said conduit means for heating the air input to said conduit of said air flow conduit means and for simultaneously heating the liquid oil in said reservoir exterior of said conduit;

said air flow conduit means having an output pipe connected to said mist generator means.

4,637,494
APPARATUS FOR MOVING CARRIAGES ALONG LADDERS

Hitoshi Iida, and Ryoichi Nakayama, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 14, 1984, Ser. No. 671,419
Claims priority, application Japan, Nov. 15, 1983, 58-213390; Nov. 30, 1983, 58-225969
Int. Cl.[4] B66B 9/20; E04G 3/14
U.S. Cl. 187—10 14 Claims



1. Apparatus for moving along a structure having ledges comprising:

a carriage;

a plurality of gripper units operatively associated with said carriage, each one of said gripper units including grippers for gripping a ledge of said structure;

drive means for moving said carriage along said structure in one or another direction;

reciprocating means carried by said carriage for reciprocatingly extending said gripper units toward and away from said ledges;

motive means operatively associated with said gripper units for opening and closing said grippers for causing the same to grip and release said ledges;

detecting means operatively connected to said carriage for detecting positions of said ledges; and

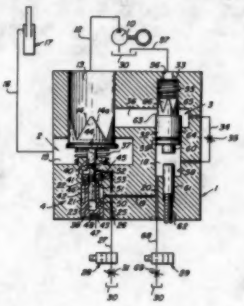
means cooperating with said gripper units and said detecting means for halting extension of said gripper units toward said ledges when said gripper units are sufficiently close to grip one of said ledges.

4,637,495
PRESSURE/VISCOSITY COMPENSATED UP TRAVEL FOR A HYDRAULIC ELEVATOR

Roy W. Blain, Bollinger Hofe, D-7100 Heilbronn, Fed. Rep. of Germany

Filed Oct. 9, 1985, Ser. No. 785,780
Int. Cl.[4] B66B 1/04
U.S. Cl. 187—29 A 7 Claims

1. In an hydraulic elevator control system including a pressure fluid source (10) having a supply and a return, means including a check valve (2) connecting the supply of said source with a cylinder 17 of the elevator, and means including a by-pass valve (3) connected across said source for by-passing said check valve, said by-pass valve normally being biased by biasing means (33) to the open condition and including a by-pass chamber (18) for receiving pressure fluid from said source via a fluid restrictor (35) for displacing said by-pass valve to the closed condition against the force of said biasing means, and means including a solenoid valve (29) operable to connect said chamber with the return of said source and setting valve means (4) for controlling the operation of said check valve means as a function of the pressure of fluid in said by-pass chamber; the improvement which includes means (44,170) for mixing with the fluid supplied from said by-pass chamber to said setting valve a secondary volume of fluid that flows over

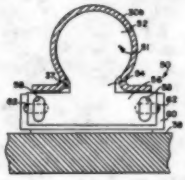


pressure and viscosity sensitive long-edged restrictor means (170).

4,637,496
ELEVATOR RAIL SYSTEM

Richard E. Atkey, Memphis, Tenn., and Oscar E. Gilliland, Nesbit, Miss., assignors to Dover Corporation, New York, N.Y.

Filed Apr. 25, 1985, Ser. No. 726,811
Int. Cl.[4] B66B 7/02
U.S. Cl. 187—95 18 Claims



1. In an elevator system having a vertically displaceable car, a rail system for guiding said car comprising at least one rail section, omega-shaped in cross-section thereby to have a circular portion defining an interior space and terminating in a pair of oppositely extending flanges, with an elongated slot therebetween running axially the length of the rail section, and mounting means engaging the rail section for mounting the section to a building structure, wherein said mounting means comprises a plurality of bracket means, each having a first bracket portion disposed in the interior space and a second bracket portion extending through said slot to the exterior of the rail section, wherein said first bracket portion is in the form of a substantially flat plate lying at least substantially in a plane transverse to the axis of the rail section and engaging said interior wall at locations for retaining said first bracket portion against movement, relative to said rail section, in said plane, and means engaging said second bracket portion for attaching said bracket means to a building structure.

4,637,497

SELF-ENERGIZING DISC BRAKES

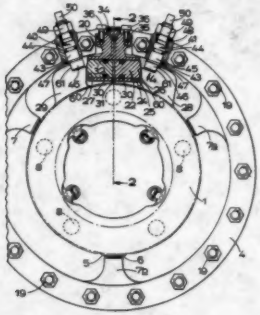
Klaus Hillen, Neuwied, Fed. Rep. of Germany, assignor to Lucas Industries, Birmingham, England

Filed Feb. 12, 1986, Ser. No. 828,785

Claims priority, application United Kingdom, Feb. 13, 1985, 8503668

Int. Cl.[4] F16D 65/46, 65/48, 65/50

U.S. Cl. 188—71.4 7 Claims



1. A self-energising disc brake comprising a housing, first and second axially spaced braking surfaces in said housing, radial pilot lugs and a drag-taking stop abutment in said housing, first and second pressure plates centred on said pilot lugs, adjacent faces of said pressure plates being provided with co-operating oppositely inclined angularly spaced recesses, rolling bodies located in complementary pairs of said recesses, a rotatable friction member disposed between each said pressure plate and an adjacent one of said braking surfaces, each said member comprising a disc, and first and second linings of friction material for engagement with each said pressure plate and said braking surface carried by opposite faces of said discs, and means for moving said pressure plates angularly relative to said housing to initiate application of said brake with said pressure plates also moving axially to urge the friction members into engagement with said braking surfaces due to a tendency for said rolling bodies to ride up ramps defined by said adjacent faces and constituting camming means, said plates being carried round with said discs until one of said plates is arrested by the engagement of a lug on that plate with said drag-taking stop abutment, whereafter continued angular movement of the other of said plates provides a servo action, wherein said drag-taking stop abutment comprises a cam shaft rotatable in a radial bore in said housing, and a cam which is mounted on the inner end of said cam shaft to adjust the relative circumferential position of said stop abutment in response to rotation of said cam shaft.

4,637,498

SELF ADJUSTING ACTUATOR FOR VEHICLE BRAKES

Richard E. Thompson, Gwent, Wales, and Robert G. Uzzel, Redditch, England, assignors to Lucas Industries, Birmingham, England

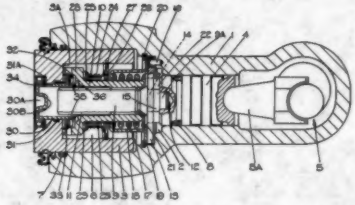
Filed Feb. 1, 1985, Ser. No. 697,509

Claims priority, application United Kingdom, Feb. 9, 1984, 8403388

Int. Cl.[4] F16D 65/56

U.S. Cl. 188—71.9 13 Claims

1. A brake actuator, comprising: a pair of actuator components separable by the application of hydraulic pressure and associated respectively with first and second adjuster members which are interengaged by means of a reversible screw threaded connection; one of said members being rotatable and the other non-rotatable, the rotatable member being arranged to follow brake-applying movement of one of the actuator components and being movable axially relative to the other adjuster member by rotation therealong in response to excessive movement of said one actuator component; a clutch means operable under spring force normally to prevent rotation of said rotatable adjuster member until adjusting movement thereof is required; said one actuator component including an auxiliary part which is axially and rotationally movable relative to said one component and which is in fluid-tight relationship with the latter; said auxiliary part being manually operable



from an exterior of said one actuator component to drivingly engage said rotatable adjuster member, so that, by roatation of said auxiliary part, said rotatable adjuster member can be rotated relative to said one actuator component in a first direction to effect de-adjustment of the adjuster; said auxiliary part being moveable into engagement with said rotatable adjuster member for de-adjustment of said reversible screw threaded connection, and subsequently being disengaged therefrom.

4,637,499

EXPANDER MECHANISM FOR AN INTERNAL SHOE DRUM BRAKE

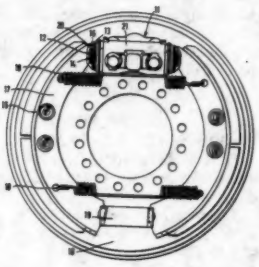
Bernd Rupprecht, Edingen-Neckarhausen, Fed. Rep. of Germany, assignor to Deutsche Perrot-Bremse GmbH, Mannheim, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,338

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434736

Int. Cl.[4] F16D 65/24, 65/42

U.S. Cl. 188—79.5 R 2 Claims



1. An interior shoe drum brake, comprising an expander mechanism affixed to a brake support, the expanding mechanism including opposed co-axial adjusting screws, and pressure pieces interposed between the exterior end surfaces of the respective screws and flange members of the respective brake shoes wherein the exterior end surfaces of the adjusting screws are provided with respective part-spherical inner ends of the pressure pieces, and wherein outer ends of the respective pressure pieces engage the flange members of the respective brake shoes via groove-type guide means perpendicular to the axis of the drum brake for providing wear-compensating relative movement between the brake shoes and the pressure pieces.

4,637,500

HYDRODYNAMIC COUPLING WITH SERIALLY ARRANGED DAMPER UNITS

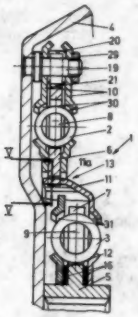
Hilmar Göbel, Schwebenried, and Harald Raab, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,769

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218192

Int. Cl.[4] F16D *3/12*; F16H *45/02*

U.S. Cl. 192—3.28 5 Claims



1. Hydrodynamic coupling, comprising

a pump wheel (24) drivable in rotation about a rotation axis,

a turbine wheel (25) coupled fast in rotation with a drive-output shaft (27), said turbine wheel being arranged together with said pump wheel (24) rotatably coaxially in relation to said pump wheel (24) in a hydrodynamic fluid cycle,

a housing (4) enclosing said turbine wheel (25) and connected fast in rotation with said pump wheel (24),

a controllable bridge-over clutch (23*a*) connected into a torque transmission path betwwen said housing (4) and said drive-output shaft (27),

a torsional vibration damper (1) arranged in said torque transmission path containing said bridge-over clutch (23*a*),

wherein said torsional vibration damper (1) comprises two damper units (2, 6, 10; 3, 7, 11 12) arranged in series with one another in said torque transmission path, each of which comprises a separate disc part (6; 7) coaxial with said rotation axis, a cover part (10; 11, 12) axially adjacent to each said disc part (6; 7) and rotatable in relation thereto throught a limited angle about said axis of rotation, and several springs (2; 3) held in ports (8, 30; 9, 31) of each said disc part (6; 7) and of said cover part (10; 11, 12) and stressable in the relative rotation of each said disc part (6; 7) and said cover part (10; 11, 12), said springs (2) of a first (2, 6, 10) of said two damper units being arranged on a larger radius than said springs (3) of a second (3, 7, 11, 12) of said two damper units, and means are formed on said first damper unit (2, 6, 10) and on said second (3, 7, 11, 12) damper unit for the meshed interengement of said first damper unit with said second damper unit so that said first and second damper units are coupled for rotation with one another and said first damper unit and second damper unit being axially displaceable relative to one another.

4,637,501

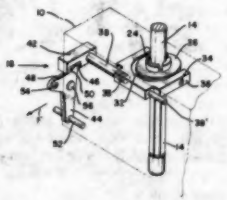
GEAR MOTOR DECOUPLING DEVICE

John C. Vaiden, Wayne, N.J., assignor to Simmonds Precision, Tarrytown, N.Y.

Filed Apr. 9, 1985, Ser. No. 721,543

Int. Cl.[4] F16D *11/04*

U.S. Cl. 192—20 6 Claims



1. A decoupling device for a gear motor comprising,

a housing,

an output shaft extending throught said housing,

a drive gear rotatably mounted on said output shaft,

a coupler member slidably mounted on said output shaft,

an overcenter spring mounted on said output shaft adjacent said coupler member,

a yoke member threadably mounted on an axially rotatable shaft means and defining a threaded joint therebetween, said yoke member being connected to said coupler member for translating movement thereto along said output shaft for coupling said drive gear therewith in one end-stop position and decoupling said drive gear therefrom in another end-stop position,

a cam-follower fixedly supported on one end of said rotatable shaft means,

a cam pivotally supported adjacent said cam-follower for angularly displacing said cam-follower to thereby rotate said rotatable shaft means and said yoke member thereon to one of said end-stop positions, wherein rotation of said rotatable shaft towards one of said end-stop positions serves to tighten said threaded joint, and

said cam-follower having spaced apart stop means for restricting the angular movement of said cam between said end-stop positions.

4,637,502

OVERLOAD RELEASE MECHANISM FOR TORQUE COUPLINGS

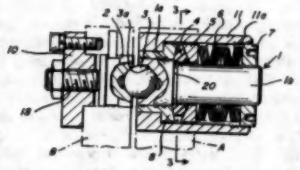
Fritz Mayr, Mauerstetten, and Manfred Dasser, Nesselwang, both of Fed. Rep. of Germany, assignors to Christian Mayr GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,898

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402860

Int. Cl.[4] F16D *43/20*

U.S. Cl. 192—56 R 5 Claims



1. An overload release mechanism comprising

a control plunger,

a housing for slidably supporting said control plunger for axial displacement from an advanced coupling position to a retracted release position,

said control plunger having a first portion having a first diameter, a second portion having a second smaller diameter and an inclined annular surface joining said first and second portions,

means for maintaining said control plunger at said advanced coupling position until a predetermined axial force is applied and then permitting axial displacement of said control plunger to said retracted release position including

a control ring having an inner diameter substantially the same as said second control plunger diameter,

said control ring comprising a plurality of discrete individual circumferential segments forming a substantially continuous ring when extending round said second control plunger portion,

said control ring having a first inclined surface for matingly engaging and substantially coextensive with said inclined annular control plunger surface when said control plunger is at said advanced coupling position,

a pressure ring,

said housing and said pressure ring each including an annular surface, said annular surfaces being tapered towards each other outwardly in the radial direction,

said control ring having a second annular surface for matinly engaging with said pressure ring surface, and a third annular surface for matingly engaging with said housing annular surface, and

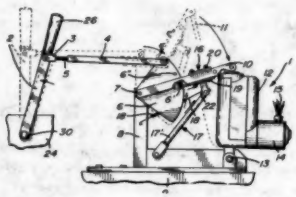
spring means for urging said pressure ring inclined surface in a direction opposite to the direction of movement of said control plunger to said retracted position against said second annular control ring surface to forcefully locate said control ring against said inclined annular control plunger surface.

4,637,503

CONTROL DEVICE FOR CLUTCH

Paul-Eugène Vohl, 1738 Principale Street, Saint-Marc des Carrières, Canada (G0A 4B0)

Filed May 3, 1985, Ser. No. 729,927
Int. Cl.[4] F16D *23/12*
U.S. Cl. 192—83 **6 Claims**



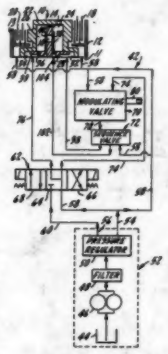
1. A control device for an over center,friction type clutch comprising a main shaft, friction type clutch plates, a floating plate for clampingly engaging said clutch plates, a sleeve axially slidable on said shaft, over center levers interconnecting said sleeve and floating plate, a thrust bearing having an inner race fixed to said sleeve, a manually-operable control lever acting on the outer race of said thrust bearing and pivotable between a first position in which said clutch plates are disengaged, and a second position in which said clutch plates are engaged through axial thrust exerted on said thrust bearing, said control lever, when released, returning to a third position intermediate said first and second positions and close to said second position to eliminate said axial thrust on said thrust bearing, said control device comprising a fixed support, a swing arm and a pivotal plate both pivoted to said support, a link member pivotally interconnecting said control lever and said pivotal plate, a power-operated means connected to said swing arm to pivot the same about said support, a pivotal plate-engaging means movably mounted on said swing arm and biased into engagement with said pivotal plate to fixedly interconnect said swing arm and said pivotal plate, a release means to release said pivotal plate-engaging means from said pivotal plate, said power-operated means actuable to pivot said swing arm, the latter in turn pivoting said pivotal plate through said pivotal plate-engaging means between a first limit and a second limit position causing said control lever to take its first position and its second position, respectively, said release means releasing said pivotal plate-engaging means from engagement with said pivotal plate when said pivotal plate reaches its second limit position to allow said pivotal plate to pivot back towards its first limit position, thereby releasing said control lever to return to its third position.

4,637,504

COMBINATION RANGE AND MASTER CLUTCH ASSEMBLY

Robert D. Rule; Bruce A. Skaggs, and Gerald E. King, all of Rockford, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 3, 1985, Ser. No. 719,406
Int. Cl.[4] F16D *25/11*
U.S. Cl. 192—87.17 **13 Claims**

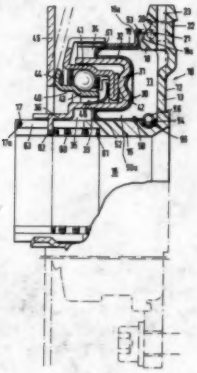


1. A combination range and master clutch assembly comprising a separator plate, first and second clutches, fluid actuated main piston means slidable relative to said separator plate for selectively engaging said first and second clutches, said separator plate and main piston means defining first and second main chambers in communication with each other, first and second fluid actuated accelerator pistons slidable relative to said separator plate and main piston means, said main piston means and first and second accelerator pistons respectively defining first and second accelerator chambers, means responsive to sliding of said accelerator pistons for blocking said communication between said main chambers, and control means for providing fluid at an operating pressure which may be modulated between low and high pressures, said control means including means for modulating said operating pressure, said control means selectively delivering fluid to said first accelerator chamber at said operating pressure when it is below a threshold pressure level, and delivering fluid to said first accelerator and first main chambers at said operating pressure when it is above said threshold pressure level.

4,637,505
FLUID-OPERATED CLUTCH DISENGAGING APPARATUS

Lothar Huber, Bühl-Altschweier, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Continuation of Ser. No. 414,432, Sep. 2, 1982, Pat. No. 4,526,258. This application Jun. 28, 1985, Ser. No. 750,747
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136548
The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.
Int. Cl.⁴ F16D *23/14, 25/08*
U.S. Cl. 192—88 A **12 Claims**

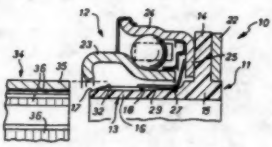


7. A fluid-operated disengaging apparatus for clutches, particularly for the clutches of automotive vehicles, comprising a housing having an open side and including inner and outer walls defining a chamber; a hollow annular piston axially reciprocably received in said housing; means for preventing radial movements of said piston relative to said housing; and a throw-out bearing installed in said hollow piston and arranged to share the axial movements of said piston relative to said housing, said bearing being movable radially of said piston and having rolling elements which are at least partially confined in said piston.

4,637,506
CLUTCH RELEASE BEARING AND ASSEMBLY TOOL FOR SAME

René Billet, Lamorlaye, France, assignor to Valeo, Paris, France

Filed Jun. 1, 1984, Ser. No. 616,277
Claims priority, application France, Jun. 2, 1983, 83 09145
Int. Cl.⁴ F16F *1/34*; B25B *27/30*
U.S. Cl. 192—110 B **11 Claims**



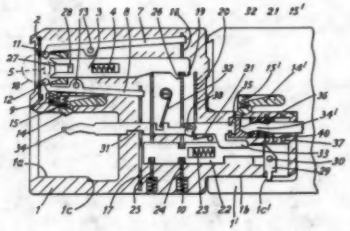
1. Assembly tool for assembling a clutch release bearing of the type comprising a maneuvering member adapted to be acted on by a control member, a drive member responsive to the maneuvering member to operate the clutch release device of a clutch, two transverse shoulders on the maneuvering member facing each other in the axial direction and an axially acting spring washer for retaining the drive member to the maneuvering member in the axial direction to bear on a first of the shoulders on the maneuvering member and to bias the drive member in the axial direction against a second of the shoulders, the spring washer having axial lugs with free ends for bearing on the first shoulder, and circumferentially spaced axial grooves extending through the first shoulder and accessible from the end of the maneuvering member remote from the second shoulder; said assembly tool being of unitary construction and annular configuration and comprising circumferentially spaced axial rib means for sliding movement in the axial grooves of a clutch release bearing maneuvering member to engage free ends of the axial lugs of a clutch release bearing spring washer to flex the lugs over the first shoulder of a clutch release bearing maneuvering member and into axial abutment with the first shoulder.

4. clutch release bearing comprising a maneuvering member to be acted on by a control member, a drive member responsive to said maneuvering member to operate a clutch release device of a clutch, two transverse shoulders on said maneuvering member facing each other in the axial direction, and an axially acting spring washer retaining said drive member to said maneuvering member in the axial direction, said spring washer bearing on a first of said shoulders on said maneuvering member to bias said drive member in the axial direction against a second of said shoulders, said spring washer ahving circumferentially spaced axially extending lugs engageable with said first shoulder, circumferentially spaced axial grooves extending through said first shoulder and accessible from the end of said maneuvering member axially remote from said second shoulder.

4,637,507
COIN LOCK DEVICE FOR SHOPPING TROLLEYS

Jacques Ricouard, Sancoins, and Claude Chappoux, Mornant; both of France, assignors to Ronis S.A., Lyons, France

Filed Mar. 27, 1985, Ser. No. 716,867
Int. Cl.⁴ G07F *17/10*
U.S. Cl. 194—212 **11 Claims**



1. A coin lock device comprising
(a) a housing formed with an aperture for the reception of a protruding element of an identical coin lock device,
(b) a protruding element extending from said housing serving to engage an aperture of an identical coin lock device,
(c) a locking mechanism within said housing having a locking member extending into the aperture of said lock device effecting locking together of said coin lock device and an identical coin lock device when said aperture of the coin lock device is in reception of the protruding element of the identical coin lock device,
(d) a coin operated mechanism for releasing said locking mechanism on insertion of an appropriate coin,
(e) means for releasing said coin on introduction of a protruding key element of an identical coin lock device,
(f) an elongated slide piece within said housing,
(g) a key element profiled with raised and recessed portions,

secured to said slide piece at one end thereof and extending from within said housing into the aperture in said housing

(h) a spring urging said slide piece in one direction,

(i) a cylinder core slidably movable within a bore in said housing and secured to the other end of said slide piece, and

(j) tumblers disposed transversely of the longitudinal axis of the bore and engageable with apertures formed in the wall of the bore when said core is in a rest position, said tumblers being capable of being pushed out of engagement with said apertures by the introduction of a protruding key element of an identical coin lock device into the cylinder core, whereupon said core is movable against the influence of said spring to effect release of said locking mechanism.

4,637,508

APPARATUS FOR CARRYING AND SEPARATING ARTICLES

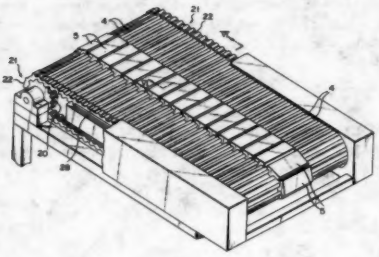
Kunio Kikuchi, Minami-ashigara; Fujio Kamada, Atsugi, and Masao Osawa, Isehara, all of Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,758

Claims priority, application Japan, Jun. 18, 1984, 59-124873

Int. Cl.[4] B65G *47/46*

U.S. Cl. 198—365 **6 Claims**



1. An apparatus for carrying and separating articles, comprising:

a pair of parallel carrying means;

a plurality of carrying rods bridging said pair of carrying means;

a number of carriers each provided between adjacent ones of said carrying rods for relative sliding movement; and

separating means for moving said carriers in transverse directions;

wherein each said carrying means includes:

an endless belt with teeth formed of an elastic material, a core embedded in said elastic material, said core being flexible but substantially incapable of elongation or contraction in the length direction, a plurality of pins projecting from the inner side surface of said belt, and opposite ends of said carrying rods are mounted on said belts by said pins;

each of said pins has an embedded portion and an engaged portion, said embedded portion being embedded in a region of the associated belt not occupied by the core, said engaged portion being fitted in an end of the associated carrying rod; and

said embedded portion of each pin has a crescent sectional profile, a plane surface of said embedded portion corresponding to the chord of the crescent section is in close contact with one surface of said core, and a stepped portion is provided in each pin in a region connecting said embedded portion and the remaining part of the pin, said stepped portion abutting said inner side surface of each belt.

4,637,509

ARTICLE GROUPER FOR CASE PACKER

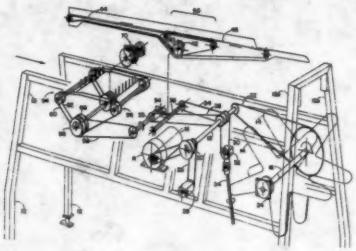
John L. Raudat, North Madison, and Timothy H. Thompson, Durham, both of Conn., assignors to Standard-Knapp, Inc., Portland, Conn.

Continuation-in-part of Ser. No. 565,754, Dec. 27, 1983, Pat. No. 4,552,261. This application Jun. 28, 1985, Ser. No. 750,340

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—425 **4 Claims**



1. In a conveyor system wherein side-by-side columns of articles are to be grouped for handling in a packer or the like, the combinaton comprising several side-by-side infeed plate conveyors for moving the columns of articles in a downstream direction, lane guides provided between said plate conveyors to maintain the integrity of the article columns, a plurality of side-by-side conveyor chains, projecting pins carried by said chains, variable speed drive means for moving one of said chains at a speed which varies cyclically as the chains follow a closed orbit that includes an upper run oriented so that the pins moved in the same path and in the same direction as the advancing articles, differential means coupling said one chain to another of said chains so that said pins move in the same orbit but it is speed which varies inversely to that of said one chain and pins, said pins provided in staggered relationship to one another in said orbit to provide a predetermined pitched distance between said pins as they move along said upper run, said pitched distance between pins and said conveyor chains varying cyclically between maximum and minimum limits, means for adjusting said differential means to provide a desired spread or difference between said maximum and minimum pin pitch limits, the individual flat plate conveyor means moving the columns of articles toward said upper runs of said conveyor chains where the articles are decelerated to the plate conveyor by the projecting pins, and said flat plate conveyor is also serving to accelerate the groups of articles away from the pins in order to provide a desired spacing therebetween.

4,637,510

LINE PANS

James E. Tomlinson, Barnsley, England, assignor to Anderson Strathclyde PLC, Glasgow, Scotland

PCT No. PCT/GB83/00244, § 371 Date Jun. 1, 1984, § 102(e) Date Jun. 1, 1984, PCT Pub. No. WO84/01359, PCT Pub. Date Apr. 12, 1984

Continuation of Ser. No. 617,999, Jun. 1, 1984, abandoned. This PCT application Sep. 30, 1983, Ser. No. 859,854

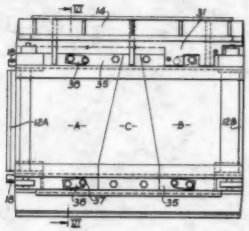
Claims priority, application United Kingdom, Oct. 2, 1982, 8228202

Int. Cl.[4] B65G *19/28*

U.S. Cl. 198—735 **9 Claims**

1. A line pan for an AFC conveyor comprising a pair of sigma-section sides parallel and transversely spaced, a deck plate between the sides and a base plate to which the sides are attached, characterised in that the upper part of each sigma-section side and the deck plate are removably attached to the

lower parts of the sigma-section sides and the base plate, said deck plate having a transverse slidable coplanar section supported for sliding movement out of an opening formed between the upper and lower parts of at least one sigma-section side for inspection of line pan conveyor components below such base plate slidable section.



4,637,511

LONGER LASTING WOVEN POLYARAMIDE BELTING FOR HIGH TEMPERATURE APPLICATIONS

Charles E. Johnson, East Aurora, and Richard W. New, Tonawanda, both of N.Y., assignors to Buffalo Weaving and Belting Company, Buffalo, N.Y.

Continuation-in-part of Ser. No. 340,845, Jan. 30, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,905

Int. Cl.[4] B65G *15/30*

U.S. Cl. 198—846 **11 Claims**

1. Woven flexible belting, suitable for conversion to conveyor belting of increased cut resistance, heat resistance, and strength, and longer operating life, comprising warp and fill textile threads and yarns, which threads and yarns are of polyaramide condensation product of terephthalic acid and 1,4-diaminobenzene, and a plurality of unbraided and unfilled separate thermally conductive metal binder wires distributed over the belting width, running longitudinally and extending to a plane between a major surface of the belting and 1 mm. past such surface, with the binder wires each having 4 to 20 filaments therein, and being a distance apart in the range of 1.5 to 5 mm., with 5 to 20% of the lengths of such binder wires projecting to or beyond the major belting surface and with such wires extending about 10 to 80% throught the belting, so that they extend to or beyond one major surface of the belting, but not the other.

4,637,512

TOOTHPICK DISPENSER

Forrest D. Smith, P.O. Box 3784, Eureka, Calif. 95501

Filed Aug. 30, 1985, Ser. No. 771,065

Int. Cl.[4] B65D *85/28*

U.S. Cl. 206—103 **20 Claims**

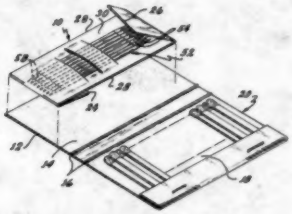
1. A toothpick dispenser useful for attachment to a matchbook cover comprising:

an elongated sheet of thin pliable material having a top side, an underside, two side edges and two ends;

first and second fold lines dividing said sheet into an upper flap, a lower flap and a main panel intermediate said flaps;

first, second and third cuts in said main panel terminating short of said side edges;

said lower flap being folded against the underside of said main panel to define a pocket for receiving the lower ends of toothpicks inserted through said first cut;



said second and third cuts defining a retainer band for holding an intermediate portion of toothpicks inserted thereunder flat against the top side of said main panel;

said upper flap being foldable over the upper ends of the toothpicks and against the topside of the main panel.

4,637,513

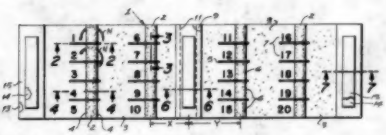
DISPOSABLE SURGICAL IMPLEMENT COLLECTOR

John D. Eldrige, Jr., Newport Beach, Calif., assignor to Instrunetics, Inc., Tustin, Calif.

Continuation of Ser. No. 6,732, Jan. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 940,399, Sep. 8, 1978, abandoned. This application Oct. 20, 1980, Ser. No. 198,827

Int. Cl.[4] A61B *17/06*; B65D *85/24*

U.S. Cl. 206—370 **1 Claim**



1. A collector for small surgical implements comprising:

(a) a pair of collector sections hinged to a common web and relatively foldable between a coplanar and a mutually engageable position;

(b) a magnet carried by the web for receiving surgical implements;

(c) a plurality of readily penetrable spaced ribs projecting upward from said surfaces;

(d) means dividing each of the ribs into a series of embossments dimensioned to receive a surgical implement; and

(e) means attached to said collector for holding said collector sections in mutual engagement.

4,637,514

THERMOFORMED PLASTIC WRAP DISPENSER

James M. Kildea, Midland, Mich.; Maria D. Bedner, Erie, Pa., and John J. Gulick, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 12, 1985, Ser. No. 743,835

Int. Cl.[4] B65D *13/00, 85/672*

U.S. Cl. 206—406 **13 Claims**

1. A one-piece thermoformed dispensing carton for a roll of sheet material for wrapping, comprising an elongated one-piece thermoformed body of plastic resin material including a pair of confronting hollow body shells having adjacent longitudinal edges interconnected by an integral hinge and further having confronting longitudinal edges, said body shells having pairs of elongated side walls and pairs of end walls, the end

walls being arranged in confronting pairs from one body shell to the other, the end walls of said confronting pairs having interengageable integral retaining means thereon for retaining said pairs of end walls in confronting relation, at least one of each interengageable means comprising a flange extending from the respective end wall, an integral cutter member comprising a flap having an edge elongated with said side walls and

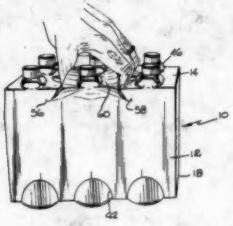
hingedly interconnected to a confronting longitudinal edge of one of said body shells by an integral hinge and overlying a side wall of that body shell and having an opposite integral serrated cutting edge of plastic resin material, and latching means on said flap interfitting with a part of said body to hold said flap in close proximity to the side wall which it overlies to hold sheet material between said flap and the side wall which it overlies.

4,637,515

WRAP-AROUND CARRIER WITH IMPROVED HANDLE

Jerry F. Wilson, West Monroe, and Richard L. Schuster, Monroe, both of La., assignors to Manville Sales Corporation, Denver, Colo.

Filed Oct. 17, 1985, Ser. No. 788,353
Int. Cl.[4] B65D 75/00
U.S. Cl. 206—434 **15 Claims**



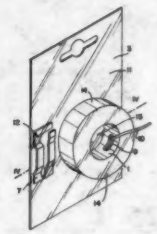
1. A wrap around article carrier, comprising:
a top panel,
a bottom panel,
side panels integral with and foldably connected to the top and bottom panels,
the top panel containing two slits extending transversely of the folds connecting the side panels to the top panel,
the slits extending across the width of the top panel and terminating in the side panels,
the slits being spaced apart a distance permitting either the thumb or the fingers of a person lifting the carrier to be inserted in either slit, and
the top panel containing at least one score line intermediate the slits and extending transversely of the folds connecting the side panels to the top panel, the portions of the top panel between the slits and the score line being adapted to fold upwardly about the score line when the carrier is lifted by the handle portion.

4,637,516

WOUND COIL OF TIE MATERIAL PACKAGED ON A DISPLAY BASE, AND A PROCESS FOR PRODUCING IT

Olivier P. R. de Roure, Rougemont le Chateau, France, assignor to Manufacture de Rougement, Paris, France

Filed Nov. 16, 1984, Ser. No. 672,482
Claims priority, application France, Nov. 23, 1983, 83 18672
Int. Cl.[4] B65D 73/00, 85/04
U.S. Cl. 206—471 **13 Claims**



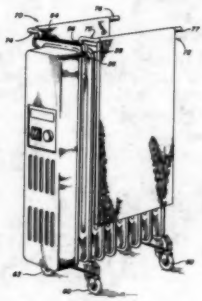
8. A wound coil of tie material packaged on a cardlike display base, the coiled tie material being held in place and surrounded by a protective sheath, the improvement comprising:
(a) said sheath consisting of a thin flexible film conforming in shape to all the visible surfaces of said coil and at least partially adhering thereto;
(b) said film continuously covering the entire surface of said card, including the area inside said coil and the area outside said coil;
(c) the only opening in said film being a hole formed therein by the end of said tie material piercing said film, as said tie material is unrolled from the inside of said coil; and
(d) means for creating a braking action for controlling the unwinding of said tie material from said coil, said means including the at least partial adherence of said film to said coil.

4,637,517

RADIATOR BRACKET

António B. Barbosa, Rua de Cabanas, 4420 Gondomar, and Joaquim C. de Campos, Rua Faria Guimaraes, 377, 4000 Porto, both of Portugal

Filed Sep. 10, 1984, Ser. No. 648,491
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—86 **1 Claim**



1. An attachment for a portable radiator having a plurality of radiator sections, each of said sections including a vertically-oriented radiator flange which circumscribes said section, said flange having two vertically extending sides, a top side and a bottom side, comprising:

a bracket having a generally U-shaped body including two elongated, parallel and coextensive sidewalls which confront each other to define a horizontal U-shaped channel, said channel being sized for snugly and alternatively receiving and engaging the bottom and two vertical sides and the top and two vertical sides of a radiator flange, said sidewalls being integrally connected so as to form a single unit,

a socket in said body adjacent each end thereof, said socket being sized for receiving a post,

a castor having a post removably connected to said body with said post secured in said socket, whereby said castor provides mobility to a radiator when the bracket receives the bottom and two vertical sides of said radiator flange, and

a hanger having a post removably connected to said body with said post secured in said socket when the bracket receives the top and vertical sides of said radiator, whereby said hanger enables articles to be hung along the sides of the radiator.

4,637,518

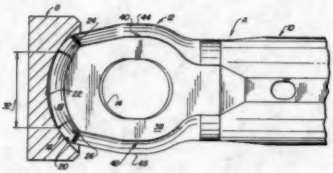
COUPLER FOR A RAILWAY CAR COUPLER ASSEMBLY

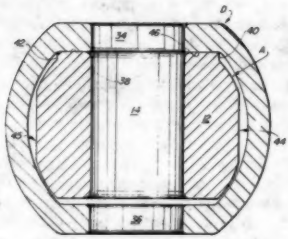
Richard M. Hanula, Lyndhurst, Ohio, assignor to Seher Acquisition Corp., Oakbrook Terrace, Ill.

Filed Apr. 8, 1985, Ser. No. 720,798

Int. Cl.[4] B61G 9/20

U.S. Cl. 213—64 **5 Claims**





1. A coupling assembly for railway cars and the like, said assembly comprising:

a coupler body including a generally rectangular butt portion having a narrower shank portion extending therefrom; said butt portion being provided at a free end thereof opposite said shank portion with a convex surface and wherein said butt portion comprises recessed spherical corners radially outward from said convex surface; and, a follower member having a concave surface therein for receiving said convex surface, said recessed corners being configured and dimensioned to be placed in a non-contacting relationship with said concave surface for reducing wear and scoring on said butt portion free end; said convex surface having a center spherical area thereof having a radius of curvature greater than the radius of curvature of the contact face of said concave surface so that a clearance is provided between the face of said concave surface and the face of said convex surface, whereby the spherical area of said convex surface defines the initial area of positive engagement with said concave surface.

5. A coupler for a railway car coupling system including a yoke and a follower, said coupler comprising:

a coupler body including a generally rectangular butt portion having a shank portion extending outwardly from one end thereof, said butt portion having a top surface and a bottom surface, and a pair of opposed side surfaces interconnecting said top and bottom surfaces, and a pin receiving aperture communicating between said top and bottom surfaces thereof, said coupler body further including relieved portions in said top surface adjacent said pin receiving aperture for allowing limited angling and preventing wedging of said coupler in an associated coupling assembly, said relieved portions extend generally axially of said butt portion generally at the intersection of said top surface with said pair of side surfaces in generally lateral spaced relation to said pin receiving aperture such that said relieved portions face away from said pin receiving aperture.

4,637,519

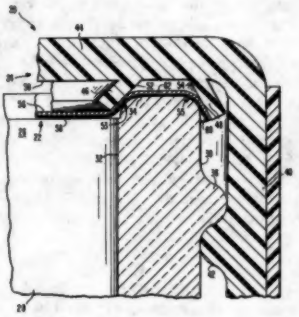
TWO PART CLOSURE

Herbert V. Dutt, and Paul A. Santostasi, both of Sarasota, Fla., assignors to Sun Coast Plastics, Inc., Sarasota, Fla.

Filed Sep. 3, 1985, Ser. No. 771,964

Int. Cl.[4] B65D 53/04

U.S. Cl. 215—232 **4 Claims**



1. A two part closure securable to a container having an open mouth bounded by an upper, generally planar mouth rim that extends between inner and outer edges of spaced inner and outer neck walls, respectively, said two part closure comprising:

a flexible foil sealing disk having a diameter slightly greater than the diameter of a container mouth rim and positionable generally atop a container mouth, said flexible foil sealing disk including an annular skirt portion at its edge; and

a linerless closure cap securable to a container, said closure cap having spaced downwardly extending inner and outer sealing flanges, said downwardly extending outer sealing flange contacting said annular skirt of said sealing disk and causing said annular skirt to contact an outer edge of an outer neck wall of a container, and said downwardly extending inner sealing flange contacting said sealing disk and causing said disk to contact an inner edge of an inner wall of a container when said two part closure is secured to a container, said spaced, downwardly extending inner and outer sealing flanges placing said flexible foil sealing disk in tension across a container open mouth and in intimate, positive sealing contact across a mouth rim of a container when said two part closure is secured to a container.

4,637,520

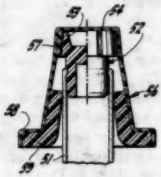
TEST TUBE PROTECTOR

Javid R. Alvi, 7970 Larwin Dr., Citrus Heights, Calif. 95610

Filed Aug. 29, 1985, Ser. No. 770,494

Int. Cl.[4] B65D *41/52*

U.S. Cl. 215—320 **3 Claims**



1. A test tube protector for a test tube having a side wall with an inside surface and an outside surface and defining an open mouth closed by a cap including a flange having a diameter greater than that of the test tube mouth and having a centrally extending plug of predetermined length adapted to extend through the test tube mouth and sealing by engaging the inside surface of the side wall, said test tube protector comprising:

a. a sleeve having an upper portion conformed to fit closely over the flange and a lower portion spaced from the plug, said lower portion of said sleeve being of more than the predetermined length of the plug and shaped to extend along the outside surface of the side wall with clearance therebetween, the material of said upper portion of said sleeve being laterally deformable by external radial force into firm gripping engagement with the flange to allow removal of the plug by an axial force simultaneously exerted on said upper portion of said sleeve and the flange and dislodging the plug from sealed position; and,

b. a sponge disc extending across said lower portion of said sleeve, said sponge disc being radially slit to afford a plurality of resilient fingers upwardly deformable by the test tube as said sleeve is urged downwardly over the mouth end of the test tube.

4,637,521

OPENABLE CAN BODY

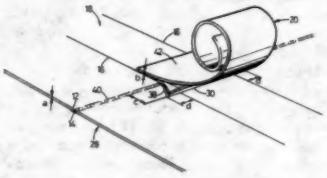
Paul Opprecht, Bergdietikon; Werner Urech, Kaiserstuhl, and Jürg Opprecht, Widen, all of Switzerland, assignors to Elpatronic AG, Switzerland

Filed Jul. 11, 1985, Ser. No. 754,340

Claims priority, application Switzerland, Jul. 12, 1984, 3404/84

Int. Cl.[4] B65D *17/36*

U.S. Cl. 220—274 **9 Claims**



1. An openable can body (10) made from a sheet-metal blank (28) with

an outer and an inner longitudinal edge (12 and 14 respectively) which are welded to one another in an overlapping manner,

at least one pair of circumferential scorings (16), which extend around the can body (10) transversely to the longitudinal edges (12,14) and define a tearing strip laterally, and

a tongue (20) which extends the tearing strip (18) beyond the outer longitudinal edge (12),

characterized in that the inner longitudinal edge (12) and the outer longitudinal edge (14) of the blank are welded together with limited overlap to form a mash weld; and

the tongue (20) is welded, as a separate sheet-metal part, to the outer longitudinal edge (12) by means of a separate weld overlying the mash weld.

4,637,522

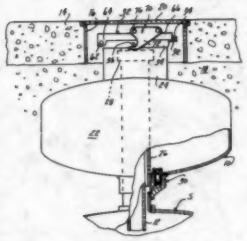
LOCKING LID FOR OVERFILL-SPILLAGE PROTECTION SYSTEM

Elmer P. Klop, Grand Haven, Mich., assignor to Enterprise Brass Works, Inc., Muskegon, Mich.

Filed Feb. 13, 1986, Ser. No. 829,409

Int. Cl.[4] B65D *45/04*

U.S. Cl. 220—322 **4 Claims**

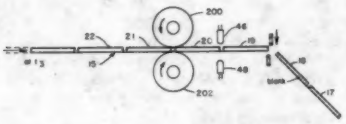


1. A locking lid assembly for use in closing the open top of a cylindrical stack of a spill containment chamber or the like, said locking lid assembly comprising an annular base member adapted to be seated upon the top of said stack with said base member extending around the outer periphery of said stack and projecting upwardly above the top of said stack, a cover lid mounted on said base member for hinging movement about a hinge axis extending generally tangentially of said base member between a closed position wherein said lid overlies said base member and an open position wherein said lid is hinged upwardly about said hinge axis from said closed position, resilient annular sealing means engageable between said lid and the upper surface of said base member to define a continuous annular fluid-tight seal between said lid and said base member when said lid is in its closed position, a pair of locking pins projecting radially outwardly from said base member at diametrically opposed locations, a pair of locking cams pivotally mounted at diametrically opposite sides of said lid for pivotal movement about a pivot axis parallel to said hinge axis and above the top of said lid, said cams each including an arm portion extending generally radially from said pivot axis in a first direction and a locking pin engaging cam portion radially offset from said pivot axis and angularly displaced about said hinge axis from said arm portion, said cams being pivotal, when said lid is in its closed position, between a cam release position and a locking pin engaging lock position, said arm portions of said cams when in said release position projecting upwardly above the top of said lid and said cam portions being disengaged from said locking pins to accommodate movement of said lid to its open position, said cams when in said lock position having their arm portions extending generally parallel to the top of said lid and said cam portions wedgingly engaged beneath said locking pins to compresss said annular sealing means between said lid and base member.

4,637,523
STAMP SCANNING AND DISPENSING MEANS AND METHOD

Joseph L. Levasseur, St. Louis County, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Feb. 8, 1985, Ser. No. 699,470
Int. Cl.[4] G07F 11/00, 1/00
U.S. Cl. 221—13 57 Claims



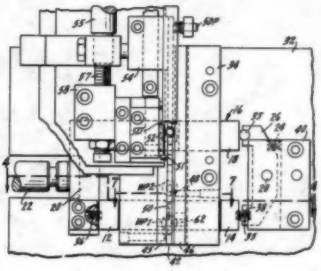
1. Scanning and dispensing means for use in a system for dispensing from a supply strip of serially ordered connected stamp-like items, which supply strip may contain invalid items interspersed among valid items, an output strip which includes one or more serially ordered connected items and at least one valid item for each invalid item included on such output strip, such system including means for producing dispense request signals, item movement means for effecting movement of the supply strip of items and the outputting of items contained thereon as such output strip during an item outputting operation, and item detaching means for use in effecting detachment of the output strip from the supply strip at the termination of such item outputting operation, said scanning and dispensing means comprising dispensing control means responsive to a dispense request signal to enable the item movement means and to thereby effect commencement of such item outputting operation, scanning means for sequentially optically scanning during such item outputting operation each item on the supply strip as the item passes thereby in order to detect the degree of opacity of such item and to produce a scanning output signal representative of such degree of opacity, the degree of opacity being determinative of the validity status of such item, boundary determination means operable to determine the occurrences of item boundaries as the supply strip of items passes by said scanning means and to produce a boundary detection signal when an item boundary occurs, and status detection means responsive to said scanning output signal to produce a status detection signal if the degree of opacity is representative of a particular validity status of the item, said dispensing control means responsive subsequent to such dispense request signal to productions of one or more of said boundary detection signals and status detection signals to control the operation of the item movement means and to effect the outputting on the output strip of at least one valid item for each invalid item included thereon, operation of the item movement means during the item outputting operation effecting the outputting for each item scanned of an item from the supply strip of items regardless of the scanned item's validity status, said dispensing control means operable during such item outputting operation to effect continuation of such item outputting operation if the last item scanned by said scanning means is an invalid item and to effect termination of such item outputting operation only upon the production of a boundary detection signal subsequent to a determination that the last item scanned by said scanning means is a valid item, such continuation of the item outputting operation being effected by further operation of the item movement means, such termination of the item outputting operation being effected by the disabling of the item movement means, said dispensing control means rendering the item detaching means usable upon termination of the item outputting operation.

38. A microprocessor controlled scanning and dispensing means for use in a system for vending from a supply strip of serially ordered connected stamp-like items of a selected type, which supply strip may contain invalid items interspersed among valid items, an output strip which includes one or more serially ordered connected items of the selected type and at least one valid item for each invalid item included on such output strip, such system including item movement means for effecting movement of the supply strip of items and the outputting of items contained thereon as an output strip during an item outputting operation, item detaching means for effecting detachment of the output strip from the supply strip, credit entry means for the entry of credit by a customer, and customer actuatable item selection means for making a vend selection, said scanning and dispensing means comprising scanning means for sequentially optically scanning during such item outputting operation each item on the supply strip as the item passes thereby in order to detect the degree of opacity of such item and to produce a scanning output signal representative of such degree of opacity, the degree of opacity being determinative of the validity status of such item, boundary determination means operable to determine the occurrences of item boundaries as the supply strip of items passes by said scanning means and to produce a boundary detection signal when an item boundary occurs, status detection means responsive to said scanning output signal to produce a status detection signal if the degree of opacity is representative of a particular validity status of the item, and a microprocessor responsive to an actuation of the selection means to determine whether the credit entered by a customer is at least equal to the vend price of the selected vend selection and, if so, said microprocessor being thereafter responsive to subsequent productions of one or more of said boundary detection signals and status detection signals to control the operation fo the item movement means and to effect the outputting on the output strip of at least one valid item for each invalid item included thereon, operation of the item movement means during the item outputting operation effecting the outputting for each item scanned of an item from the supply strip of items regardless of the scanned item's validity status, said microprocessor programmed to operate during such item outputting operation to effect continuation of such item outputting operation if the last item scanned by said scanning means is an invalid item and to effect termination of such item outputting operation only upon the production of a boundary detection signal subsequent to a determination that the last item scanned by said scanning means is a valid item, such continuation of the item outputting operation being effected by further operation of the item movement means, such termination of the item outputting operation being effected by the disabling of the item movement means, said microprocessor programmed to render the item detaching means usable upon termination of the item outputting operation.

4,637,524
MACHINE TOOLS

Adolph V. Klancnik, Glenview, and Kenneth A. Klancnik, Palatine, both of Ill., assignors to Universal Automatic Corporation, Des Plains, Ill.

Filed May 6, 1985, Ser. No. 730,497
Int. Cl.[4] B23Q 7/06
U.S. Cl. 221—239 3 Claims



1. In a machine tool in which small easily distorted work-

pieces such as hollow pins, studs and the like disposed in a supply channel are advanced from a ready position therein to a work station to have a tapping, drilling facing or like operation performed thereon, a pair of self-centering jaw members and force equalizer assembly mounted to the tool for clamping with substantially equal force opposed sides of the workpiece fed to the work station and comprising:

a substantially L-shaped jaw actuating slide having one leg guided for reciprocal movement, and means for reciprocating the slide in an advancing and retracting direction respectively when the workpiece is to be clamped by actuating the jaw members and released by relaxing the jaw members at the work station;

said slide having its other leg located on one side of the work station;

an equalizing rocker arm positioned on the other side of the work station and pivoted at its mid-point to present one end portion thereof in the path of the one leg of the slide for actuation by the advancing slide to locate the jaw members in the clamping mode;

the free end of said one leg of the slide engaging one end of the rocker arm to pivot the rocker arm when the slide advances;

a first jaw member guided for sliding movement and having one end opposed to said other leg of the slide so as to be advanced therewith in a closing direction toward the workpiece at the work station when the slide advances;

a second jaw member guided for sliding movement and disposed on the side of the work station opposite the first jaw member and opposed to the other end portion of said rocker arm to be advanced thereby in a closing direction toward the work station when the rocker arm is actuated;

said jaw members at their inner ends nearer the work station presenting a holding recess for clamping the sides of a workpiece advanced from the supply channel thereto, said equalizing rocker arm assuring the workpiece in the holding recess in held on opposite sides with an equal force when the slide is advanced to actuate both jaw members;

a first spring interposed between said one end of the first jaw member and said other leg of the slide, a second spring interposed between said other end of the rocker arm and said second jaw member, whereby the springs are effective to apply a bias to the jaw members tending to close the jaw members; and

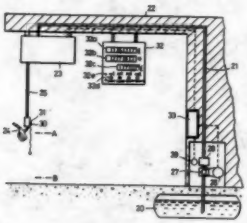
a reciprocal feed finger for feeding the workpieces in the channel successively to the recess presented by the jaw members when the jaw members are relaxed.

4,637,525

CONTROL SYSTEM FOR CONTROLLING THE SUPPLY OF A PREDETERMINED QUANTITY OF FLUID

Yukio Miura, Yokohama, and Yoshikazu Miyamoto, Kokubunji, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Apr. 13, 1984, Ser. No. 600,004
Claims priority, application Japan, Apr. 20, 1983, 58-69410
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—22 **2 Claims**



1. A control system for controlling a supply of a predetermined quantity of fluid, said control system comprising:

a pump for supplying a fluid;

a motor for driving said pump, said motor being rotated when a current is applied thereto;

measuring means for measuring a flow quantity of the fluid which is supplied by said pump, said measuring means also measuring an oversupply quantity ΔQ of the fluid which is supplied by the pump after the current to the motor is cut off;

presetting means for presetting, before starting a fluid supplying operation, a preset value P which is indicative of a desired fluid supplying quantity; and

control means supplied with a measured flow quantity from said measuring means and the preset value P from said presetting means for controlling the application of the current to said motor,

said control means comprising memory means for storing minute current applying durations and a predetermined value K, where K is a predetermined value greater than said oversupply quantity ΔQ, each of said minute current applying durations stored in said memory means corresponding to minute quantities of fluid which will be supplied by the pump when the current is applied to the motor for said minute current applying durations, first means for applying the current to said motor until the measured flow quantity from said measuring means becomes equal to P−K, and second means for applying the current to the motor m times for selected minute current applying durations until a total flow quantity Q of supplied fluid measured by said measuring means becomes approximately equal to the preset value P, where m is an integer,

$$Q = (P - K) + \Delta Q + \sum_{n=1}^{m} q'n,$$

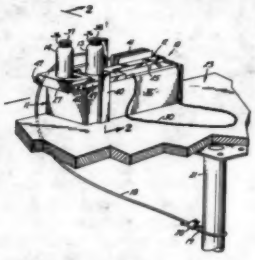
and q'n is a quantity inclusive of an oversupply quantity measured by said measuring means in each of the minute current applying durations, said second means successively calculating a difference P−Q between said preset value P and the total flow quantity Q of supplied fluid measured by said measuring means, successively selecting a current applying duration out of the minute current applying durations stored in said memory means so that the selected current applying duration corresponds to the calculated difference P−Q, and applying the current to said motor for the selected current applying duration to drive said pump so as to reduce the calculated difference.

4,637,526

THEFT RESISTANT CONDIMENT CONTAINER

Edmund G. Ellingboe, Rte. 3, Belgrade, Minn. 56312

Filed Feb. 10, 1986, Ser. No. 827,634
Int. Cl.[4] B67D *5/62*; A47K *1/08*
U.S. Cl. 222—146.2 **8 Claims**



1. A theft resistant condiment dispenser comprising:

a first support member designed to rest upon the top of a table;

a first elongated flexible member having one portion secured to the first support member and having a spaced end portion in the form of a loop sufficiently large to surround a typical table leg, the flexible member being effective when the loop is so engaged over a table leg to prevent ready removal of the support member from the table supported by the leg;

a second support member normally supported by said first support member;

a condiment receptacle having apertures adjacent the top thereof for dispensing a condiment when the receptacle is tipped sufficiently, the condiment receptacle being fixedly secured to the second support member; and

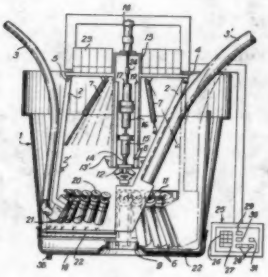
a second flexible member fastened at its opposite ends to the first and second support members, the second flexible member being sufficiently long that the second support member can be removed from the first support member and actuated to move the condiment receptacle secured thereto to the desired point of use on a table and to be tipped to dispense the condiment at the desired location.

4,637,527

APPARATUS FOR DISPENSING PIGMENTS

Giordano Arrigoni, Via Marconi 47, Cassano Magnago, Italy

Filed Jan. 23, 1984, Ser. No. 572,860
Claims priority, application Italy, Feb. 8, 1983, 19479 A/83
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—144 **4 Claims**



1. Apparatus for dispensing metered quantities of a plurality of fluid materials, comprising:

plural metering valves arranged in a circular array about a central axis;

plural flexible fluid supply lines respectively connected to an associated one of said metering valves and respectively connected to a supply of one of said fluid materials;

plural guide and support members each carrying one of said metering valves, and movable between an advanced position in which the associated metering valve is substantially aligned with said central axis, and, a retracted position in which the associated metering valve is withdrawn from said central axis and repositioned within said circular array;

plural independent drive means, each said drive means being connected to an independent one of said guide and support members and for moving the associated guide and support member between said advanced and retracted positions;

means sequentially activating selected ones of said independent drive means; and

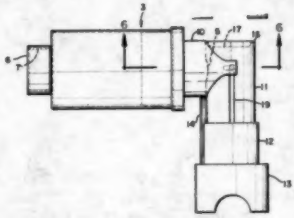
an actuator means for operating said metering valves when in said advanced position, said actuator means being positioned in axial alignment with said central axis, and including gear driven gripping means activated by a rack under the control of a fluid actuated piston and cylinder arrangement.

4,637,528

ARTICULATED JOINT IN AEROSOL MEDICAMENT DISPENSER

Clarence A. Wachinski, Abington, and Thomas J. Bigger, Perkasie, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Jan. 19, 1984, Ser. No. 572,292
Int. Cl.[4] B65D *83/14*
U.S. Cl. 222—182 **5 Claims**



1. A medicament spray dispenser for dispensing from an aerosol medicament container having a valve actuable to dispense a measured dose of medicament in aerosol form, comprising:

an elongated housing for holding and at least partially enclosing said container;

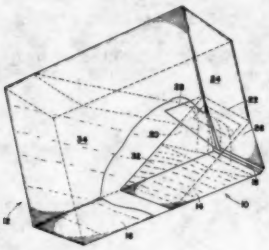
nozzle means at one end of the housing including a passageway connected to said valve, said nozzle means further including a spray nozzle leading from said passageway and pointing outwardly of said housing on an axis extending transverse to the long axis thereof;

a hollow open-ended sleeve telescopically mounted on said housing for longitudinal sliding motion between a retracted position overlying said spray nozzle and an extended position in which at least a major portion of said sleeve extends beyond the nozzle end of the housing;

joint means interconnecting the sleeve and the housing for relative sliding and pivotal movement, said joint means comprising a pair of oppositely disposed pins affixed to and projecting inwardly from the side surfaces of the sleeve, said housing having on its side wall a pair of oppositely disposed longitudinal slots equidistantly disposed from the axis of the spray nozzle, said slots extending to points adjacent the axis of the spray nozzle for receiving said pins, elongated studs attached to the inward end of each said pin, said elongated studs extending perpendicularly to each said pin, each said elongated stud being rigidly fixed relative to said sleeve, said sleeve when in the extended position being rotatable from a position of coaxial alignment with the long axis of the housing, each said stud being elongated in a direction extending lengthwise of its slot when said sleeve is in said position of coaxial alignment with said housing whereby a substantial surface area of each stud underlies the housing side wall adjacent to the end of the slot when the sleeve is in the extended position thereby interlocking the sleeve and the body against accidental separation during rotation of the sleeve from the position of coaxial alignment;

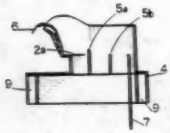
and abutment means positioned adjacent the studs to block rotation of said studs and said sleeve from the position of coaxial alignment in a direction away from the position of alignment with the spray nozzle.

4,637,529
MEASURING DISPENSER
George L. Knight, 305 Larkin Dr., Benicia, Calif. 94510
Filed Nov. 17, 1983, Ser. No. 553,141
Int. Cl.[4] G01F *11/28*
U.S. Cl. 222—452 2 Claims



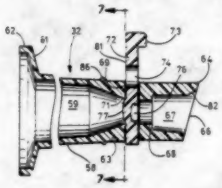
1. A measuring dispenser for particulate material comprising:
an open top receptacle with a pair of side walls of generally triangular configuration;
the top and front edges of said side walls forming substantially right angles;
front and rear walls interconnecting the front and rear edges of said side walls;
means forming a fill-opening in said rear wall near said open top so that said receptacle may be filled by tipping same to bring said front wall downward;
a lid hinged to the top edge of said rear wall; and
a fill-opening closure depending from the rear of said lid to pivot therewith;
said fill-opening closure being disposed at an angle to said lid greater than the angle between the top and rear edges of said side panels so that it may be pivoted with said lid into engagement with said rear wall to cover said fill-opening when said lid is lifted.

4,637,530
DISPENSER FOR A LIQUID CONTAINER
Chih-Chang Jiang, No. 24, Chen-Kang Street 1, Tau-Yuen, Taiwan (330)
Filed May 9, 1985, Ser. No. 732,290
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—564 5 Claims



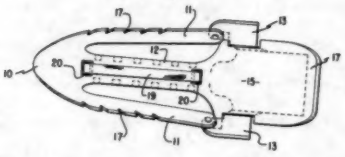
1. A liquid dispenser, comprising a cylindrical throat with a pouring spout protruding from one side of the top end of the throat the spout having a pouring direction perpendicular to a direction of flow through the throat, and an annular flange extending around the throat, said dispenser includes a plurality of substantially parallel vertically arranged flow-interrupting means formed in the pouring spout and throat, said flow-interrupting means extending upwardly to different levels respectively and being disposed substantially perpendicular to the pouring direction of the liquid through the spout, and said dispenser includes a tongue provided on the liquid passage of the pouring spout for directing the liquid flow and for recovery of any drop of liquid that may drip down the outer wall of the container after pouring.

4,637,531
SPOUT WITH GATE
Sven O. Olsson, 7019 Kerry Rd., Edina, Minn. 55435
Continuation-in-part of Ser. No. 428,121, Sep. 29, 1982, Pat. No. D. 227,827. This application Mar. 4, 1985, Ser. No. 707,830
Int. Cl.[4] B65D *47/00*
U.S. Cl. 222—559 17 Claims



8. A spout for dispensing material comprising: a body having a passage, an inlet end, and an outlet end section, said outlet end section having a generally transverse upper lip, a transverse slot extended across said passage and a continuous annular bead surrounding the passage, said bead projected into the slot, and gate means having a hole allowing material to flow through said passage and a convex curved portion spaced from the hole, and a recess opposite said convex curved portion, said convex curved portion projected toward said annular bead, said gate means being movable to a first position wherein the hole is aligned with said passage to allow flow of material through said passage and movable from the first position to a second position wherein the convex curved portion is surrounded by said annular bead to close said passage.

4,637,532
DEVICE FOR ASSISTING IN PUTTING ON ELASTIC HOSIERY
Daryl E. Doorenbos, R.R. 2, Box 85A, Le Mars, Iowa 51031
Filed Mar. 13, 1986, Ser. No. 839,147
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—111 10 Claims



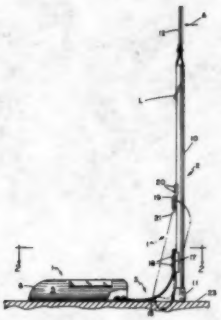
1. A device comprising rail means arranged to spread a stocking, tongue means resiliently mounted on said rail means, said rail means and tongue means being normally in a nearly planar relation, said tongue means being movable to a displaced position out of said planar relation, means to hold said tongue means in said displaced position whereby a stocking disposed over said rail means will be held open for the insertion of a user's foot and leg.

4,637,533

FOOT WEAR DRESSING AID

Maurice Black, 2412 S. Washington Ave., Saginaw, Mich. 48601

Filed Nov. 12, 1985, Ser. No. 797,038
Int. Cl.[4] A47G 25/90
U.S. Cl. 223—112 17 Claims



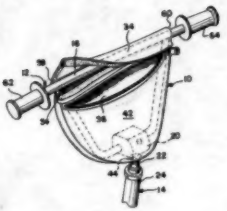
1. A device for assisting a person in donning an article of hosiery, said device comprising an open top, trough-like support member open at both ends and having a bottom and a pair of spaced apart sides upstanding from said bottom; an elongate, rigid handle having opposite ends; and flexible coupling means joining one end of said support member to said handle adjacent one end thereof, the spacing between said sides enabling the accommodation therebetween of a foot of said person, and the spacing between and the height of said sides enabling the opposite end of said support member to be accommodated in said article of hosiery, the flexibility and the length of said coupling means enabling said support member and said handle selectively to occupy positions in which they substantially parallel one another, extend in substantial prolongation of one another, or are in a position substantially normal to one another and in which latter position the bottom of said support member and said one end of said handle simultaneously may engage a flat surface.

4,637,534

ANTITHEFT BICYCLE HANDLEBAR BAG

William W. Leppek, Lima, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 31, 1986, Ser. No. 846,187
Int. Cl.[4] B62J 7/00
U.S. Cl. 224—36 11 Claims



1. An antitheft bag for mounting on the handlebars of a bicycle, comprising:

opposing front and rear portions;

a pair of opposing side positions extending between said front and rear portions;

upper closure means extending between said front and rear portions for closing said bag about a handlebar crossbar; and

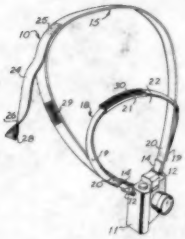
a bottom portion extending between said front, rear, and side portions and having a hole shaped to receive a handlebar stem therethrough, said bag being continuous about a periphery of said hole, whereby said bag is attachable to a bicycle between an associated handlebar stem and bicycle head tube, and cannot be removed therefrom without separation of a handlebar stem thereof from an associated head tube.

4,637,535

CARRYING STRAP FOR CAMERAS AND THE LIKE

Javier Aleman, 1146 Fourth St., Stone Mountain, Ga. 30083

Filed Oct. 1, 1985, Ser. No. 782,373
Int. Cl.[4] A45F 3/02
U.S. Cl. 224—202 5 Claims



1. A carrying strap assembly for camera and the like, said strap assembly comprising a principal strap for suspending said camera around the neck of a person so that said camera is in position for easy use, and an auxiliary strap means for supporting said camera in a secure position for transport of said camera, said principal strap including a first strap having a first end and a second end connected to said camera for supporting said camera, said first strap being long enough to pass around the neck of the person carrying the camera and to support said camera in an easy use position, said auxiliary strap means including a second strap having a first end and a second end fixed with respect to said camera, said first end and said second end of said second strap being adjacent to said first end and said second end of said first strap, said second strap being shorter than said first strap and having an appropriate length for supporting said camera from said person's shoulder and securing said camera beneath said person's arm, and further including a securing strap, said securing strap having a first end fixed to said first strap and a second end relasably fixable to said first strap, said securing strap being selectively releasably fixable to said second strap for holding said auxiliary strap means with respect to said principal strap.

4,637,536

PERSONAL BINOCULAR SUPPORT

Wilbur Wong, Highway Contract Rte. Box 3228, Oracle, Ariz. 85623

Filed Aug. 14, 1985, Ser. No. 765,878
Int. Cl.[4] A45F 3/08
U.S. Cl. 224—262 20 Claims

1. A personal optical-aid holder for suporting an optical aid in relation to the body of a user, during use, comprising:

a base;

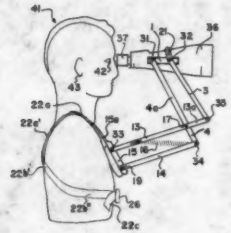
means for securing the base to, and supporting the base from, such user's torso exclusively;

a platform adapted to receive and hold such optical aid;

a mechanical linkage interconnecting the platform and the base, and positioning the platform in relation to the base, so as to substantially support such received and held opti-

cal aid in viewing positions substantially at such user's eyes;

the linkage being adapted for easy control by such user, without such user's raising his or her hands to the viewing positions of such optical aid; and



the linkage being geometrically arranged to translate and rotate such optical aid vertically, under substantially continuous manipulation by such user, to substantially follow movement of such user's head and eyes in scanning upwardly from the horizon.

4,637,537

PAPER FEEDER FOR A PRINTER

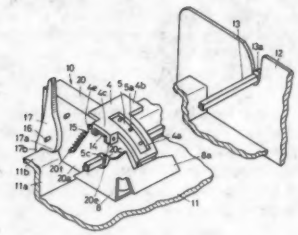
Hiroshi Ikeda, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 21, 1985, Ser. No. 736,313

Claims priority, application Japan, May 22, 1984, 59-74039[U]

Int. Cl.⁴ B65H *20/20*

U.S. Cl. 226—76 **4 Claims**



1. In a printer having a frame, a platen, a pair of paper feed units provided adjacent to said platen to feed a paper web to an underside of said platen, and a common drive shaft for said feed units parallel with the axis of said platen and rotatably supported on the frame, each of said paper feed units comprising:

a case slidably engaged with a support plate of said frame;

a sprocket wheel rotatably mounted on said case and slidably engaged with said drive shaft;

clamping means for securing said case to said support plate;

a paper holder pivotally mounted on a shaft disposed on said case in the paper feeding direction so as to hold said paper web on an upper periphery of said sprocket wheel and to feed said paper web to said underside of the platen; and

a paper guide plate secured to said case;

said paper guide plate having a paper guide portion positioned in a space between said platen and said paper holder so as to guide said paper web to said platen while preventing buckling or wrinkling of said paper web.

4,637,538

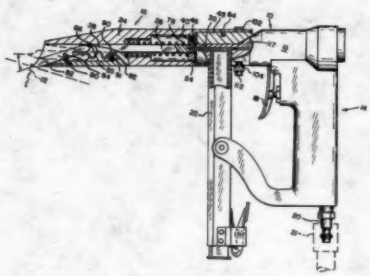
STAPLE REMOVER

Wayne M. Wagner, 102 NW. 76th St., Vancouver, Wash. 98665

Filed Aug. 12, 1985, Ser. No. 764,590

Int. Cl.⁴ B25C *11/00*

U.S. Cl. 227—63 **11 Claims**



1. An apparatus for use in combination with a pneumatic powered staple gun for removing staples from a surface penetrated by a staple, comprising:

an elongate casing having an open nose end;

staple pulling bit means having a chisel shaped end portion with a predetermined length and a width sized for insertion lengthwise along a surface beneath a staple;

means for pivotally mounting the bit means in the casing adjacent the nose end;

a plunger adapted for reciprocal movement lengthwise within the casing relative to the bit means;

translation means mounted on the plunger and adapted to contact the bit means for translating reciprocal movement of the plunger into movement of the bit means transverse of the plunger;

means for moving the plunger reciprocally lengthwise in the casing with respect to the bit means;

means for attaching a rear end portion of the casing opposite said open nose end to a pneumatic powered staple gun; and

means disposed in said rear end portion of the casing for reciprocably coupling the plunger to a driver in the staple gun.

4,637,539

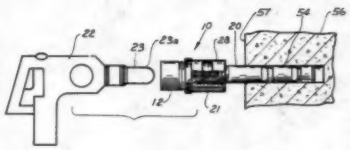
ANCHOR BOLT INSTALLATION TOOL WITH DEPTH STOP

James L. Turcott, 93 Granada Calle, Grandbury, Tex. 76048-1468, and Rodney C. Matheny, 433 N. Joliet, Kennewick, Wash. 99336

Filed Sep. 10, 1984, Ser. No. 648,988

Int. Cl.⁴ B25C *1/18;* B25D *17/06*

U.S. Cl. 227—156 **4 Claims**



1. An anchor bolt installation tool for use with an impact driving means for installing an anchor bolt to a specified depth within a previously formed receiving hole in concrete or other material, comprising:

a cylindrical body piece having a longitudinal axis, a bolt end and a driver end, the bolt end having a threaded bolt recess formed therein along the longitudinal axis for threadably receiving the anchor bolt therein, said threaded bolt recess having a front wall for contacting end surfaces of the anchor bolt; said driver end having a driver receptacle formed therein along the longitudinal axis for receiving portions of the impact driving means therein, said driver receptacle having a receptacle end wall, said body piece being solid between said receptacle end wall and said front wall of the threaded bolt recess, said body piece having exterior threads formed thereon;

a cylindrical guide piece having internal threads which are adjustably and threadably received upon the exterior threads of the body piece and adjustably extendible beyond the bolt end thereof so as to engage an exposed surface of the material into which the anchor bolt is being installed, thereby determining the depth to which the anchor bolt is driven;

a jamb ring threadably received upon the exterior threads of the body piece for engaging the guide piece and maintaining the position thereof; and

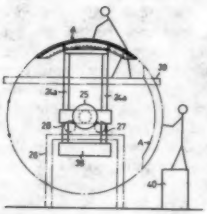
locking means for fixing the relative position of the guide piece upon the body piece.

4,637,540

METHOD AND APPARATUS FOR ASSEMBLING A STRUCTURE COMPOSING A VEHICLE'S BODY AND THE LIKE

Yoshitada Fujita, Kobe; Sadashi Hanada, Miki, and Yoshiaki Yamamoto, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 9, 1984, Ser. No. 670,056
Claims priority, application Japan, Nov. 10, 1983, 58-211276
Int. Cl.⁴ B23Q *3/00*
U.S. Cl. 228—49.2 **3 Claims**



1. A method of assembling an elongated structure having a longitudinal axis, comprising the steps of: connecting an elongated box to said structure so that the longitudinal axis of said box extends parallel to and on one side the longitudinal axis of said structure; connecting an elongated balance weight to said elongated box parallel to and on the opposite side of said longitudinal axis of said structure; providing rotatable shaft for the combination of the structure, the elongated box, and the balance weight at longitudinally spaced, opposite ends of said box so that the shafts coincides with the center of gravity of the combination of said structure, elongated box, and balance weight; placing said rotatable shafts with said combination upon at least two pair of driven rollers wherein said rotatable shafts are rotatably retained by gravity on said rollers rotating the structure, elongated box, and balance weight and stopping rotation of the combination of said structure, elongated box and balance weight in desired angular positions to perform assembly operations.

3. An apparatus for assembling an elongated structure, such as a roof of a vehicle body, comprising: a retaining system for the stucture, including an elongated box having a pair of cylindrical shafts at opposite longitudinal ends of said box, and means for supporting the structure essentially parallel to said shafts about the exterior of said elongated box; an elongated adjustable balance weight attached to said elongated box so as to extend esser.tially parallel to said elongated box on an opposite side of said cylindrical shafts so that the center of gravity of the combination of said elongated box, said balance weight, and the structure essentially coincides with said cylindrical shafts, a pair of cylindrical rollers for rotatably supporting said cylindrical shafts, means for driving said cylindrical rollers, and pedestal means for supporting said shaft and cylindrical rollers, the elongated box, balance weight, and cylindrical shafts assembly being maintained on said rollers by gravity, and readily removeable from said rollers for attachment and disattachment of said structure from said elongated box by lifting said assembly from said cylindrical rollers.

4,637,541

CIRCUIT BOARD SOLDERING DEVICE

Michael W. Tanny, Westminster, Calif., assignor to Unit Industries, Inc., Fullerton, Calif.

Filed Jun. 28, 1985, Ser. No. 750,333
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—180.1 **22 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 15 Pages)

1. A circuit board soldering apparatus comprising the following elements:

(a) a longitudinal base unit having two longitudinally extending sides connected to a first end and an opposing second end, a top portion connected to and bounded by said sides and ends with an open longitudinal central cavity, and two spaced apart parallel longitudinally exending rails mounted on the top portion on opposing sides of said central cavity;

(b) a foam means for generating a flux foam standing wave mounted in said central cavity approximately midway between said ends for applying a flux coating to the solder side of a circuit board;

(c) a heated solder pot mounted in said central cavity approximate said second end to hold a pot, molten solder bath for soldering the solder side of the circuit board;

(d) an air knife means for generating a warm air stream mounted in said central cavity between said foam means and said solder pot for drying a flux coating on the circuit board;

(e) a powered, wheeled circuit board transport adapted to ride on said rails to carry a circuit board from the first end across the foam means and the air knife means to the second end over said solder pot and back again;

(f) two powered cam means laterally mounted in said transport, said cam means rotatable to a high home position, a medium fluxing position and a low soldering position, said cam means adapted to carry and vertically move a circuit board carrier to a high home position, a medium fluxing position and a low soldering position;

(g) first sensing means to detect the position of said transport;

(h) second sensing means to detect the position of each of said cam means; and

(i) control means connected to said first and second sensing means to receive signals therefrom and connected to said

powered transport and said powered cams to send control signals thereto.

12. A process for soldering circuit boards comprising the steps of:

(a) applying a solder flux coating to the solder side of a board;

(b) drying the flux on the board and preheating the solder side of the board by sequentially:

(i) directing a stream of warm gas over the solder side of the board,

(ii) heating, over a hot molten solder bath, the solder side of the board, with the heat emanating from the surface of said bath,

(iii) directing a stream of warm gas over the solder side of the board at a position away from the hot molten solder bath,

(c) soldering the solder junctions on the board by immersing the solder side of the board into the surface of a hot molten solder bath by sequentially:

(i) immersing a first edge of the board into the surface of the solder bath,

(ii) lowering the remainder of the board into the surface of the solder bath,

(iii) lifting the board from the surface of said bath at an angle to said surface to drain excess hot molten solder from the board.

4,637,542

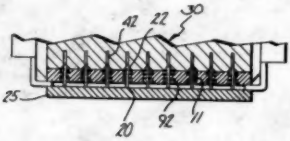
PROCESS FOR SOLDERING AND DESOLDERING APERTURED LEADLESS PACKAGES

Carl D. Breske, Scandia, and Jeffrey M. Borning, Ham Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Division of Ser. No. 421,604, Sep. 22, 1982, Pat. No. 4,518,110. This application Feb. 8, 1985, Ser. No. 699,719

Int. Cl.[4] B23K *1/12*; H01L *23/48*

U.S. Cl. 228—180.1 **2 Claims**



1. A method of soldering a chip having an array of sockets to an array of pins comprising the steps of:

securing said chip to a heater member with the top of said chip immediately proximate a heating plate of said heater member, said chip having a solder plug formed in each of said sockets;

positioning said tool such that said chip is set onto an array of pins such that each of said pins aligns with one of said sockets;

applying heat to said heating plate to reflow said solder plugs and form solder joints between said pins and said sockets; and

releasing said chip from said heater member to allow such solder joints to cool and solidify.

4,637,543

FIBER CAN WITH REINFORCING CRIMPED METAL CLOSURE

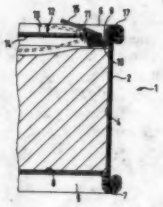
Helmut Kücherer, Schriesheim, Fed. Rep. of Germany, assignor to Weidenhammer Packungen KG GmbH & Co., Hockenheim, Fed. Rep. of Germany

Continuation of Ser. No. 603,201, Apr. 23, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 783,060

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413918

Int. Cl.[4] B65D *3/14*

U.S. Cl. 229—5.6 **16 Claims**



1. A can comprising: a laminated fiber can body having a gas-tight fusible lining, an end wall shutting off one end of said body, the end wall being in the form of a metal plate with a peripheral crimping lip rolled together with a captured portion of the fiber can body to form an overlapped joint and a metal structural reinforcing ring at said one end of the fiber body, a partly metallic cover on the opposite end of the can body, said cover being formed as a rigid cover member having a peripheral crimping lip that is rolled outwardly together with a captured portion of the fiber can body at the opposite end into an overlapped joint between the rigid cover member and said opposite end of the can body, the rolled crimping lip and captured portion of the fiber can body together providing a structural reinforcing ring at said opposite end of the fiber body to withstand stresses developed at the joint and adjacent areas of the fiber body by pressure differences between the inside and outside of the can, said cover member having on its inner side a fusible coating that has an affinity for and is brought into sealing contact with the lining of the body within the overlapped reinforcing joint to form a gas-tight seal, said rigid cover member forming the structural reinforcing ring for the fiber body having an opening and a flexible covering diaphragm fixed in position over said opening, said covering diaphragm being adapted to undergo a change in form when a pressure difference comes into existence between the inside and outside of the can after the sealing thereof whereby the pressure difference is accommodated without developing significant strain at the crimped and sealed joints between the cover member, the metal end wall, and the fiber body.

4,637,544

PROCESS FOR THE MANUFACTURE OF BOXES, THE BOXES WHICH RESULT THEREFROM AND THE ELEMENTS FOR THEIR COMPOSITION

Alessandro Quercetti, Strada S. Vito Revigliasco 48, I-10133 Torino, Italy

Filed Dec. 28, 1984, Ser. No. 687,286

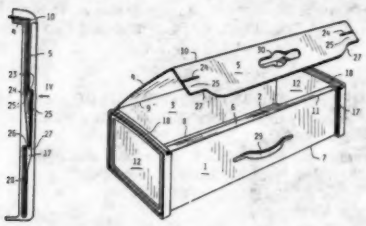
Claims priority, application Italy, Jan. 13, 1984, 67027 A/84

Int. Cl.[4] B65D *5/66*

U.S. Cl. 229—44 R **24 Claims**

6. A box comprising: a punched element of a flexible sheet material having at least five sections and at least four parallel score lines separating said five sections, said punched element being bent along said score lines; and two side walls formed of synthetic material, each side wall having a first U-groove including at least three branches, and a second groove parallel to and closely disposed on the outer side of one of the branches

of said first U-groove; the end edges of at least three of said sections of the punched element being firmly engaged in corresponding branches of said first U-grooves of the two side walls,



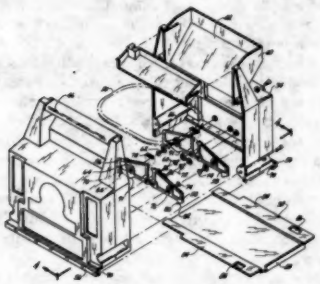
a fourth section forming a lowerable and liftable cover, and the terminal section being adapted to be inserted in, and extracted from, said second groove of the two side walls, to close and to open the box.

4,637,545

WASTE MANAGEMENT SYSTEM

Gene L. Stewart, San Diego, Calif., assignor to Winfield Corporation, San Diego, Calif.

Filed Mar. 25, 1985, Ser. No. 715,638
Int. Cl.[4] B65D *85/24*
U.S. Cl. 232—43.2 **44 Claims**



22. A waste management system including a movable cart having a waste box for the reception of waste stored in disposable containers, including,

a module for forming a hollow cover having a large open end and with the module including a passageway for receiving medical waste from the exterior to the interior,

a disposable container for reception within the open end of the module to have the container enclosed by the module and with the passageway leading to the disposable container,

a locking plate positioned across the open end of the module to fully enclose the disposable container,

a locking means coupled to the module and the locking plate for locking the locking plate across the open end of the module, and

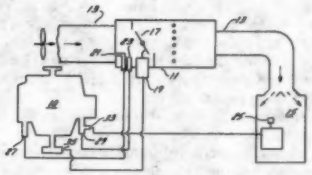
a key plate for disposition between the locking plate and the module for unlocking the locking plate from the open end of the module and with the key plate coupled to the locking means for locking the key plate across the open end of the module in substitution of the locking plate.

4,637,546

PNEUMATIC DIFFERENTIAL PRESSURE CONTROLLER

Roy W. DeMeyer, Oconomowoc, Wis., assignor to Johnson Service Company

Filed Sep. 16, 1985, Ser. No. 776,575
Int. Cl.[4] F24F *7/00*
U.S. Cl. 236—49 **10 Claims**



1. A differential pressure controller for regulating the flow of air through a duct and including:

a housing;

a diaphragm stack disposed in said housing and including a pair of seal diaphragms and a sensing diaphragm disposed intermediate said seal diaphragms, said sensing diaphragm and said seal diaphragms defining a pair of pressure chambers, said sensing diaphragm being movable in response to the difference in pressures prevailing in said chambers, the pressure in one chamber including a component representative of a thermostat control signal;

a leakport for flowing air to an external control device;

a valving seat coupled to said sensing diaphragm, and movable therewith along an axis of movement, said valving seat coacting with said leakport for controlling the flow of air to said external device;

a first spring disposed coaxially with said axis of movement and exerting a force upon said valving member in a direction to close said leakport;

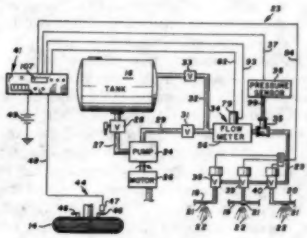
a second spring disposed coaxially with said axis of movement and exerting a force upon said valving seat in a direction to open said leakport, said springs permitting the adjustment of the setpoint of said controller.

4,637,547

CONTROL METHOD AND APPARATUS FOR LIQUID DISTRIBUTOR

Thomas K. Hiniker, Mankato, and Vincent N. Bush, Madison Lake, both of Minn., assignors to Hiniker Company, Mankato, Minn.

Division of Ser. No. 405,323, Aug. 5, 1982, Pat. No. 4,530,463. This application Mar. 22, 1985, Ser. No. 714,879
Int. Cl.[4] B05B *9/06*
U.S. Cl. 239—1 **18 Claims**



1. A method of dispensing liquid from a plurality of spray nozzles of a transportable liquid dispensing device over an area

of ground at a uniform density independent of the ground speed of the dispensing device, the nozzles each having conditions of operability and inoperability, comprising the steps of

(a) measuring the ground speed of the transportable dispensing device and generating a first signal in accordance with the ground speed;

(b) entering at least one flow rate parameter into a microprocessor-based control device to provide a given flow rate of liquid to the dispensing device;

(c) measuring the actual liquid flow rate within the dispensing device and providing a second signal in accordance with the measured flow rate;

(d) measuring the liquid pressure within the dispensing device and providing a third signal in accordance with the measured pressure;

(e) entering said first, second, and third signals into the control device;

(f) calculating a control signal in accordance with said first, second, and third signals and said flow rate parameter; and

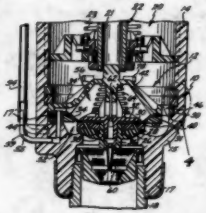
(g) controlling the flow of liquid from the nozzles in the operable condition to provide a constant uniform liquid density over the dispensing area independent of the ground speed of and the pressure within the dispensing device.

4,637,548

RELEASABLE LOCKING ASSEMBLY FOR SPRINKLER VALVE UNITS

Charles A. Ray, Arcadia, and Samuel C. Walker, Diamond Bar, both of Calif., assignors to Anthony Manufacturing Corp., Azusa, Calif.

Filed Jul. 12, 1984, Ser. No. 630,227
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—201 **16 Claims**



1. A locking assembly for releaseably locking a valve unit within a sprinkler housing or the like in an operative position for opening and closing a pressurized water inlet port to control water flow into the housing, said locking assembly comprising:

shoulder seat means within the housing for supporting an upstream side of the valve unit when the valve unit is in the operative position;

a radially inwardly opening lock groove formed in the housing generally adjacent the side of the valve unit opposite said shoulder seat means when said valve unit is in the operative position, said lock groove having an upper end limit within the housing and spaced above the valve unit when the valve unit is in the operative position;

a plurality of snap rings releaseably engaged in vertically stacked relation within said housing lock groove, each of said snap rings having an upper and a lower generally radial face, said upper face of the upper of said plurality of vertically stacked snap rings being in abutting engagement with said groove upper end limit, and said lower face of the lower of said plurality of vertically stacked snap rings being engaged with said side of said valve unit opposite said shoulder seat means, each of said snap rings being independently releaseable from said lock groove;

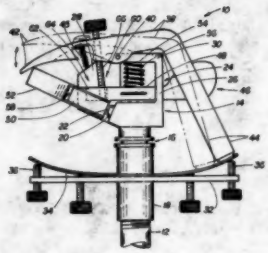
whereby upon release and removal of at least one but less than all of said snap rings from said lock groove, the valve unit can move upwardly within the housing away from the operative position to an extent limited by engagement of said upper face of the upper remaining snap ring with said groove upper end limit thereby opening the pressurized water inlet port yet preventing removal of the valve unit from the housing until all of said remaining snap rings have been released and removed from said lock groove.

4,637,549

ROTATION SPEED CONTROL DEVICE FOR A ROTARY, IMPULSE WATER SPRINKLER AND A WATER SPRINKLER HAVING SAME

Joel Schwartzman, 47 James Dr., Ringwood, N.J. 07456

Filed Apr. 30, 1985, Ser. No. 729,067
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—230 **7 Claims**



1. A water sprinkler apparatus comprising:

(a) a dispensing head adapted for rotational movement;

(b) at least one water dispensing nozzle associated with the dispensing head for dispensing a stream of water;

(c) speed control means for varying the rotational speed of the dispensing head as the dispensing head rotates;

(d) movable impulse means associated with the dispensing head and adapted to be at least partially located in the path of a stream of water dispensed from the dispensing nozzle for imparting an impulse force to the dispensing head to rotate the dispensing head as water issues from the dispensing nozzle; and

(e) movable baffle means associated with the dispensing head and adapted to selectively move into and out of the path of water from the dispensing nozzle to deflect the stream of water,

(f) said speed control means being operatively associated with said baffle means and impulse means for selectively limiting movement of said impulse means into the path of water from the nozzle as a function of the position of said baffle means relative to the path of water from the nozzle.

4,637,550

DUAL MATERIAL EXHAUST NOZZLE FLAP

Dudley O. Nash, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

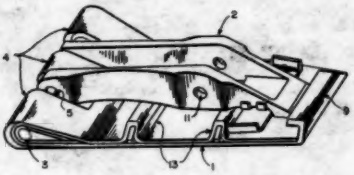
Filed Oct. 1, 1985, Ser. No. 782,332
Int. Cl.[4] B64C *9/38*
U.S. Cl. 239—265.37 **7 Claims**

1. An exhaust nozzle flap comprising:

a support member having a first set of lugs at one end and a tip at its other end;

a base member composed of heat resistant materials, said base member having a second set of lugs at one end and a retainer flap at its other end, said base member being attached to said support member in a manner which allows relative movement therebetween by having its second set of lugs interleaved with the first set of lugs of the

support member and said retainer flap encompassing said tip of said support member thereby holding it in place while allowing for differences in thermal expansion between said support member and said base member; and



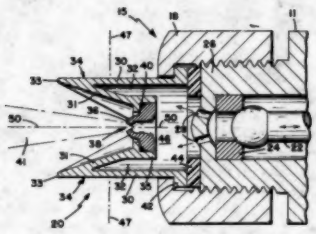
a hinge pin inserted between said first and second set of lugs of said support member and said base member, said hinge pin thereby connecting said support member to said base member.

4,637,551

SAFETY GUARD FOR AIRLESS SPRAY APPARATUS

John W. Seeger, Jr., St. Paul, and John W. Kubiak, Minnetonka, both of Minn., assignors to Seeger Corporation, St. Paul, Minn.

Filed Apr. 5, 1985, Ser. No. 720,087
Int. Cl.[4] B05B 1/28, 9/01
U.S. Cl. 239—288.5 27 Claims



1. A spray gun apparatus for airlessly spraying a liquid, comprising:

(a) a spray gun housing defining a fluid supply cavity having inlet and outlet ports;

(b) a spray tip connected to said housing at said outlet port suitable for providing a spray of high-pressure fluid passing therethrough, said spray tip defining an orifice extending along an axis and having upstream and downstream ends; sand upstream end being connected in fluid communication with said supply cavity;

(c) means operatively connected with said cavity inlet port for supplying a liquid under pressure to said supply cavity from a pressurized source of such liquid; and

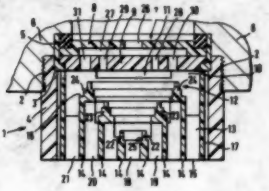
(d) a safety tip guard operatively connected to said housing and disposed adjacent said downstream end of said spray tip orifice and having a portion thereof extending in the direction of said orifice axis, said extending portion having a wall defining a tip guard cavity connected in fluid communication with said supply cavity said tip guard cavity extending to a position downstream of the orifice; wherein a breach in said wall will cause a portion of liquid within said tip guard cavity to escape through the breach, thereby decreasing pressure within said supply cavity at said upstream end of said spray tip orifice.

4,637,552

WATER JET AERATION FOR SANITARY FITTINGS AND THE LIKE

Werner Finkbeiner, and Franz Schorn, both of Schiltach, Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,659
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404662
Int. Cl.[4] E03C 1/08; B05B 7/06, 1/14
U.S. Cl. 239—428.5 31 Claims



1. A water jet ventilator for sanitary fittings and the like, comprising:

at least one device for producing a plurality of individual water jets along a direction of flow;

a housing defining at least one chamber arranged downstream of said device for producing individual jets, the housing having an opening for air access to the chambers;

at least one device for splitting and mixing the individual jets with air, having at least two separate devices for splitting up the individual jets, each having two cooperating walls defining passages which catch the individual jets, at least one of the two cooperating walls having lateral obstacles defining a staircase structure projecting into a path of the individual jets, at least one of said separate devices for splitting the individual jets having two facing cooperating walls, the cooperating walls continuing downstream of the devices and defining unobstructed channels, the cooperating walls of the separate devices having obstacles directed towards one another, the separate devices being displaced from one another in the direction of flow, and the separate devices for splitting the individual jets being so closely juxtaposed that the ventilated jets flow out as a joint ventilated jet.

4,637,553

FUEL INJECTION NOZZLE UNIT FOR INTERNAL COMBUSTION ENGINES

Takeo Kushida, and Keiichi Yamada, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1985, Ser. No. 782,871
Claims priority, application Japan, Oct. 9, 1984, 59-210496
Int. Cl.[4] F02M 57/00
U.S. Cl. 239—533.4 2 Claims

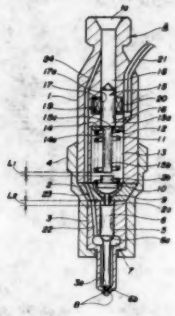
1. In a fuel injection nozzle unit for an internal combustion engine, including a nozzle body having injection holes and a pressure chamber formed therein, a nozzle needle fitted in said nozzle body and being liftable in said nozzle body to open said injection holes, a nozzle spring urging said nozzle needle in a direction of closing said injection holes, and a central plunger having one end thereof arranged opposite one end of said nozzle needle at a distance corresponding to a predetermined lift, said central plunger having another end face which is supplied with pressurized fuel, and said central plunger being liftable together with said nozzle needle against the pressure of said pressurized fuel when said predetermined lift is exceeded, said nozzle needle being lifted by a fuel pressure supplied to said pressure chamber to effect fuel injection,

the improvement comprising:

an annular-shaped, radially deformable piezo-electric ele-

ment provided around said cental plunger, said piezo-electric element having a substantially central hole therein which is penetrated by said cental plunger; and

means for selectively electrically energizing and deenergizing said piezo-electric element to selectively radially deform said piezo-electric element to thereby selectively reduce the diameter of said central hole thereof, said central hole of said piezo-electric element being sufficiently reduced in diameter to contact the peripheral



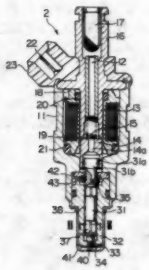
surface of said central plunger to inhibit lifting of said central plunger from a predetermined position closest to said nozzle needle when said piezo-electric element is electrically energized to thereby maintain a low rate injection, and said central hole of said piezo-electric element having a normal increased diameter so as to allow movement of said central plunger in said central hole to thereby allow lifting of said central plunger from said predetermined position when said piezo-electric element is electrically deenergized to thereby obtain a high rate injection.

4,637,554

ELECTROMAGNETIC FUEL INJECTOR WITH MAGNETIC STOP MEMBER

Hideto Takeda, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 25, 1985, Ser. No. 715,946
Claims priority, application Japan, Mar. 27, 1984, 59-60134
Int. Cl.[4] F02M *51/06*
U.S. Cl. 239—585 **12 Claims**



1. In an electromagnetically actuated fuel injector of the type that includes a movable core adapted to be electromagnetically driven by a solenoid, a valve seat member defining a valve seat and an injection orifice, a valve member connected to said movable core for movement therewith into and out of sealing engagement with said valve seat, one of said movable core and said valve member having a flange formed thereon, and a stationary stop member adapted to cooperate with said flange to limit the movement of said valve member away from said valve seat, the improvement which comprises:

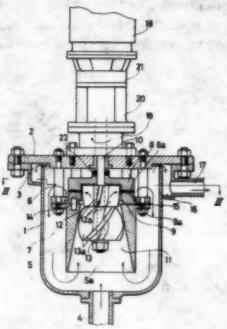
means for magnetically biasing said stop member and said flange away from each other to keep said flange closely spaced from said stop member when said valve member is out of sealing engagement with said valve seat.

4,637,555

CIRCULATION TYPE HOMOGENIZING APPARATUS

Akira Furuichi, Nishinomiya, and Akira Iijima, Takatsuki, both of Japan, assignors to Tokushu Kika Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 21, 1984, Ser. No. 643,002
Claims priority, application Japan, Oct. 24, 1983, 58-197622
Int. Cl.[4] B02C *7/08*
U.S. Cl. 241—46.02 **10 Claims**



1. A liquid homogenizing apparatus for continuously charging and treating a raw material liquid containing fine particulate solids, comprising:

(a) a stationary main barrel attached to a cover plate, said main barrel being provided at its lower portion with an opening for supply of a raw material liquid to be treated, and having an overflow space located above its upper edge and beneath said cover plate;

(b) a subsidiary barrel fixedly supported within said main barrel, so as to form an annular space between said main barrel and said subsidiary barrel, said subsidiary barrel being open at its lower end directly above and opposite the supply opening in the main barrel and provided at its upper portion with an upper grinding disk and a lower grinding disk, said grinding disks having a gap therebetween and having their respective annular grinding surfaces facing each other, said lower grinding disk being fixed to a lower portion of the subsidiary barrel and the upper grinding disk being connected to a rotary drive shaft that is inserted through said cover plate into a central portion of the subsidiary barrel so as to provide a blind liquid passage;

(c) an upper rotatable blade tube attached to said drive shaft for flowing the raw material liquid in the upper portion of said subsidiary barrel in a radial direction towards the grinding surfaces of the upper and lower grinding disks; and

(d) a lower rotatable blade tube means attached to said drive shaft and located beneath said upper rotatble blade tube for flowing the raw material liquid in an upward direction, so as to enable the raw material liquid supplied into said main barrel to be directed from the lower open end of the subsidiary barrel upwards into said blind liquid passage and then passed through the gap between the upper and lower grinding disks with a portion of the liquid capable of being circulated downwards through the annular space outside the subsidiary barrel and through the lower end

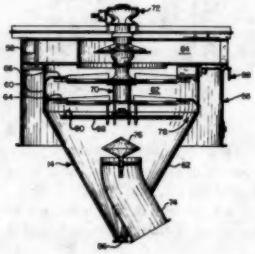
opening of the subsidiary barrel in order to obtain a homogenized liquid product.

4,637,556

HIGH EFFICIENCY SEPARATOR SYSTEM

Mark R. Dunn, Evanston, Ill., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 26, 1985, Ser. No. 759,389
Int. Cl.[4] B02C *23/34*
U.S. Cl. 241—48 **6 Claims**



1. A high efficiency separator system operative both to grind material and to separate thereafter the ground material into a finished product comprising:

(a) grinding means operative to effectuate the grinding therewithin of the material fed thereto;

(b) high efficiency separator means connected in flow relation with said grinding means for receiving therefrom all of the material ground in said grinding means as well as all of the air vented from said grinding means, said high efficiency separator means being operative to effectuate therewithin a classification of the ground material supplied thereto from said grinding means and for recirculating in the form of tailings to said grinding means for further reduction therein ground material containing particles exceeding a predetermined particle size, said high efficiency separator means comprising:

(i) housing means including a drum portion and a cone portion, said cone portion having one end thereof joined to one end of said drum portion,.

(ii) whizzer blade means supported for rotation at a first location within said housing means, said whizzer blade means defining a classification zone within said housing means, said whizzer blade means being operative to effect a classification based on particle size of feed material into a finished product as the feed material entrained in air passes through said classification zone,

(iii) a distributor plate means positioned within said housing means at a second location and so as to define between the periphery of said distributor plate means and the internal surface of said housing means an annular passage operative as a high velocity mixing zone, said distributor plate means being supported from said whizzer blade means in spaced relation thereto and so as to be rotatable therewith, said distributor plate means being operative to cause the feed material disposed thereon to be dispersed under the influence of gravity into said high velocity mixing zone,

(iv) a feed material inlet means supported in said housing means for supplying feed material on to said distributor plate means, said feed material inlet means being coaxially aligned with said whizzer blade means and having a first end thereof projecting outwardly of said housing means and a second end thereof terminating at a point intermediate said first location of said whizzer blade means and said second location of said distributor plate means,

(v) an air inlet means supported in said cone portion for supplying into the interior of said housing means air at a predetermined rate so as to ensure the existence of a predefined material to air ratio within said housing means, said air inlet means having a first end thereof projecting outwardly of said cone portion and a second end thereof terminating at a point spaced from and aligned with said feed material inlet means such that the air exiting from said second end of said air inlet means follows a once-through flow path within said housing means before exiting therefrom and in the course of doing so is made to pass through said high velocity mixing zone at a high velocity so as to effect the entrainment therewithin of the feed material dispersed into said high velocity mixing zone by said distribution plate means, and

(vi) discharge means formed in said cone portion of said housing means, said discharge means being operative for effectuating the discharge from said high efficiency separator means of the tailings that remain following the classification within said classification zone of the feed material into finished product by said whizzer blade means;

(c) dust collector means connected in flow relation with said high efficiency separator means for receiving therefrom in the form of finished product entrained in air ground containing particles that are of a predetermined particle size, said dust collector means being operative for separating the ground material particles from: the air and for discharging therefrom as separate entities both the ground material particles in the form of finished product and the air that has had the ground material products removed therefrom; and

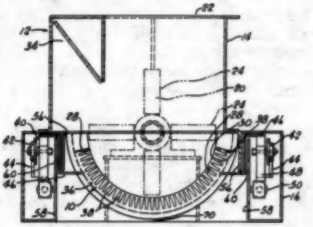
(d) fan means connected in flow relation with said dust collector means for receiving therefrom the air discharged from said dust collector means.

4,637,557

DEVICE FOR CLEANING THE SIZING SCREEN OF A MATERIAL REDUCTION APPARATUS

Edward A. Vitunac, 1618 Powers Run Rd., Pittsburgh, Pa. 15238

Filed Jul. 15, 1985, Ser. No. 754,708
Int. Cl.[4] B02C *13/284*
U.S. Cl. 241—73 **8 Claims**



1. A device for cleaning a screen in a material processing apparatus, said screen having at least a plurality of elongate bars defining spaces therebetween through which material flows, said device comprising:

rake means having a plurality of members for clearing material blocking said spaces; and

a carriage assembly for guiding said rake means along the length of said elongate bars, said carriage assembly having two rails positioned parallel to and opposite each other on opposing sides of said screen, two wheels, each said wheel being oepratively connected to said rake means and being associated with a different one of said two rails so that said wheels are guided by said rails parallel to and opposite each other on opposing sides of said screen, and paired

means for moving said wheels along said rails to provide matched drive actuation of said rake means so that said rake means moves along the length of said elongate bars in a manner which maintains said rake means in alignment with said screen.

4,637,558

VIBRATORY DECORING APPARATUS FOR CASTINGS

Günter Jenzsch, Adelsried; Kurt Rauh, Haimhausen, and Hans J. Wegscheider, Gröbenzell, all of Fed. Rep. of Germany, assignors to Rudolph Mirbeth, Puchheim/BHF, Fed. Rep. of Germany

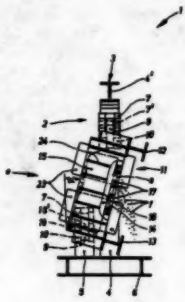
PCT No. PCT/DE84/00247, § 371 Date Jun. 27, 1985, § 102(e) Date Jun. 27, 1985, PCT Pub. No. WO85/02137, PCT Pub. Date May 23, 1985

PCT Filed Nov. 17, 1984, Ser. No. 752,046

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341894

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—79 **14 Claims**



1. Apparatus for removing core sand from a casting by vibration, comprising:

a framework;

a casting carrying unit including a pair of spaced apart horizontal arms;

means suspending the casting carrying unit from the framework so that the carrying unit can swing and vibrate freely along a path;

the means suspending the casting carrying unit from the framework comprising a pair of vertical spaced apart swingable arms, connected to both of the horizontal arms, which pivotally connect the end of each horizontal arm to the framework;

means to vibrate the casting carrying unit;

the casting carrying unit having a support bed on which a casting can rest loosely; and

the support bed having spaced apart casting restraining means between which a casting fits with predetermined clearance so that the casting can slide between and hit the restraining means when the casting is vibrated.

4,637,559

SAND LUMP CRUSHING DEVICE

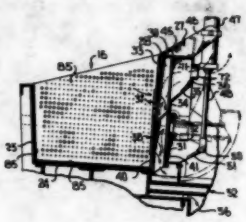
Joseph E. Bowling, Waynesboro, Pa.; James H. Carpenter, and Russell L. Rowe, both of Hagerstown, Md., assignors to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 90,028, Oct. 31, 1979, Pat. No. 4,324,367. This application Oct. 2, 1981, Ser. No. 308,092

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—94 **7 Claims**

1. A perforated crusher plate for providing an outer wall portion of a vibratory sand lump crusher tub, said plate comprising a main rectangular shaped body portion adaped to be connected to said tub in an imaginary plane inclined to the horizontal with the front face of the plate facing the interior of the tub to receive sand lumps in pressure engagement against said face, said plate having horizontally extending vertically spaced perforations in the form of slots, and horizontally extending and vertically spaced lugs projecting forwardly from



said main plate portion, said lugs having substantially the same vertical dimension of said slots and defining abrading areas in front of said slots for constantly wiping sand lumps in advance of said main plate portion during vibration of said tub to prevent extrusion of sand clumps through said slots.

4,637,560

MACHINE FOR COMMINUTING MATERIALS, SUCH AS DOCUMENTS PARTICULARLY A SHREDDING MACHINE

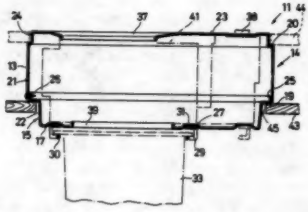
Albert Goldhammer, Ueberlingen, Fed. Rep. of Germany, assignor to Feruwerktechnik Schleicher & Co., Fed. Rep. of Germany

Continuation of Ser. No. 594,671, Mar. 25, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,904

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3312992

Int. Cl.⁴ B02C *19/00, 23/00*

U.S. Cl. 241—100 **10 Claims**



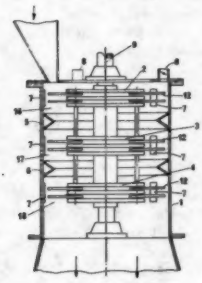
1. In a machine for comminuting paper, having a feed opening and a discharge opening end which is capable of insertion into an opening in a frame, the improvment comprising: a casing having an upper casing part and a separable lower casing part for supporting the apparatus on said frame, said upper casing part having larger dimensions in horizontal extension to said frame opening than the lower casing part, thereby forming an outwardly-directed supporting shoulder between the upper and the lower casing parts for supporting said machine in said framed opening dimensioned to receive the lower casing part, the opening being smaller than the upper casing part, a bottom of the lower casing part being provided with a discharge opening for comminuted material and having a holder for a container for the comminuted material, positioned below the lower casing part.

4,637,561

BEATER MILL HAVING AT LEAST ONE VERTICALLY OR OBLIQUELY EXTENDING CYLINDRICAL MILLING CHAMBER

Dan O. Edberg, Kolding, Denmark, assignor to A/S Ingeniorgruppen AF, Christiansfel, Denmark

Filed Nov. 15, 1983, Ser. No. 551,908
Claims priority, application Denmark, Nov. 15, 1982, 5069/82
Int. Cl.[4] B02C *13/282*
U.S. Cl. 241—154 2 Claims



1. A beater mill for milling materials such as oily grain, comprising at least one upwardly extending milling chamber having a cylindrical inner surface of an impermeable chamber wall, a rotor rotatably supported in the chamber, the axis of said rotor extending parallel to the axis of the chamber, a number of protruding beaters supported pivotably on the rotor, an inlet opening arranged above the rotor for supply of goods to be milled, and an outlet opening as well as an outlet which extends from said outlet opening away from said milling chamber, said outlet opening and said outlet both having a diameter which is at least the same diameter as the largest diameter of the inner surface of the milling chamber arranged below the rotor for discharge of milled goods, wherein the cylindrical inner surface of the milling chamber wall is smooth and free of obstructional means that may form a resistance against the flow of milling foods along the cylindrical inner surface thereby reducing the generation of heat from friction during milling, and wherein the maximum distance of the beaters from the axis of the rotor is less than the distance from said axis to the inner surface of the milling chamber.

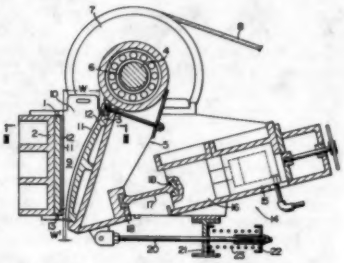
4,637,562

ROCKING SLAG BREAKER

Tatsuo Hagiwara, Funabashi; Keiji Imai, Ibaraki, and Shigenori Nagaoka, Chiba, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Ishii Syoji, Ltd., both of, Japan

Filed Jan. 4, 1985, Ser. No. 688,889
Claims priority, application Japan, Jan. 10, 1984, 59-2320; May 28, 1984, 59-108104; Nov. 9, 1984, 59-236470
Int. Cl.[4] B02C *1/10*
U.S. Cl. 241—259.2 4 Claims

1. A rocking slag breaker for breaking slags generated in furnaces comprising a stationary breaker plate means and a rocking breaker plate means arranged to oppose said stationary breaker plate means at an inclination with respect thereto to define a breaker chamber therebetween having an axis along which slags move during the breaking operation between an inlet portion defined by the upper ends of said breaker plate mean and an oulet portion defined by the lower ends of said breaker plate means, said breaker plate means both having surfaces providing opposing undulations, each undulation including alternating crests and valleys in a direction substantially perpendicular to said axis such that each crest of one of the breaker plate means opposes a corresponding valley in the other of the breaker plates means and such that the number of crests on one of the breaker plate means corresponds to the number of valleys on the opposed breaker plate means, means for supporting said rocking breaker plate means for rocking movement, breaker plate drive means for imparting rocking movement to said rocking breaker plate means, and hydraulic means connected to said outlet portion of said breaker plate means operating independently of said breaker plate drive means to increase and decrease cyclically and incrementally



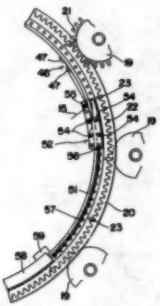
the spacing between the lower ends of the breaker plate means where they define the outlet portion of the breaker chamber to allow the slags to fall downwardly intermittently and progressively along the axis of the breaker chamber in accordance with the incremental change in spacing and cause a change of points of contact between the slags and both breaker plate means to enhance compression of the slags therebetween and reduce stagnation in the breaker chamber.

4,637,563

TOROIDAL WINDING APPARATUS

Kazuhiro Arii; Teruaki Tanaka, both of Kobe; Nobuyuki Sumida, Sakai, and Kouhei Arisaka, Takatsuki, all of Japan, assignors to Daihen Corporation, Osaka, Japan

Filed Feb. 11, 1985, Ser. No. 700,309
Claims priority, application Japan, Feb. 14, 1984, 59-18656[U]; Dec. 11, 1984, 59-187979[U]
Int. Cl.[4] H01F *41/08*
U.S. Cl. 242—4 B 4 Claims



1. A toroidal winding apparatus for winding an elongated conductor into a coil around a magnetic core having a central opening, comprising:

a circumferentially extending magazine for storing the conductor around the outer periphery thereof, and including an inside opening to pass the conductor radially inward;

a magazine stand supporting the magazine for rotation along a circumferential path of travel, and including an opening to receive the magnetic core in a position where the path

of travel of the magazine extends through the central opening of the magnetic core;

means to rotate the magazine around the path of travel, to pass the conductor from the magazine, through the inside opening, and to wind the conductor around the magnetic core;

tension slider means supported for movement along the magazine to engage and to maintain tension on the conductor, between the magazine and the magnetic core, as said conductor is wound onto the magnetic core; and

braking means connected to the magazine for rotary movement therewith to apply a braking force to the conductor as said conductor passes from the inside opening of the magazine toward the tension slider means; the braking means comprising

(i) a first roller having a first outside circumferential surface,

(ii) a second roller having a second outside circumferential surface, and

(iii) means to hold the first and second circumferential surfaces in different positions relative to each other,

the first and second rollers being positioned opposite each other to squeeze the conductor between the first and second outside circumferential surfaces as the conductor is pulled from the magazine toward the tension slider means.

4,637,564

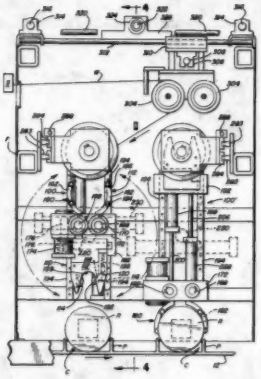
DUAL REEL CONTINUOUS WIRE WINDING MACHINE WITH ROBOTIC REEL LOADING MECHANISM

Mark Hallenbeck, Buffalo Grove, and Robert H. Frankenbush, Highland Park, both of Ill., assignors to FTS Equipment Manufacturing Co., Skokie, Ill.

Filed Nov. 4, 1985, Ser. No. 794,565

Int. Cl.[4] B65H *54/02, 67/052*

U.S. Cl. 242—25 A **26 Claims**



1. A continuous wire winding machine for winding wire on reels having a pair of spaced flanges connected by a central core, said machine comprising,

a machine frame,

conveyor means for supplying empty reels to and removing wound reels from the machine,

two pairs of arbor means for gripping and rapidly rotating reels for the winding of wire thereon, one of each of said pairs being a driven arbor,

transfer means for transferring empty reels from said conveyor means and wound reels to said conveyor means,

said transfer means comprising a pair of robotic arm assemblies, each assembly comprising a first gripper for grasping an empty reel at one end of the assembly and a second gripper for grabbing a wound reel at the other end of the assembly,

shaft means mounting each said robotic arm assembly for oscillation of said assembly through an arc of 180°, and means for oscillating said shaft, and

driving means mounting said grippers for moving them between an outwardly extended position and an inwardly retracted position relative to said assembly and said shaft,

whereby when said grippers are in their extended positions, they are enabled alternatively to present an empty reel between a pair of said arbors and to grab a wound reel positioned between said pair of arbors, and when said grippers are in their retracted positions, the assembly is enabled to be oscillated about the axis of said shaft.

4,637,565

WINDING APPARATUS FOR FORMING LAPS

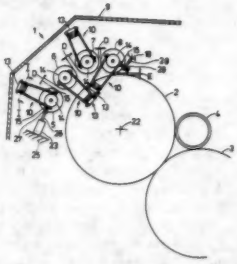
Rene Schmid, Niederneunforn, Switzerland, and Hermann Krehl, Karlsruhe, Fed. Rep. of Germany, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Oct. 3, 1984, Ser. No. 657,352

Claims priority, application Switzerland, Oct. 10, 1983, 5506/83

Int. Cl.[4] B30B *3/04;* **B65H** *18/06*

U.S. Cl. 242—55.1 **8 Claims**



1. A wind-up apparatus for forming laps, comprising:

at least one rotatable winding roller;

a predetermined number of calender rolls associated with said at least one rotatable winding roller and serving for consolidating a fiber layer into a windable fiber web;

each calendar roll of said predetermined number of calender rolls having a predetermined rest position and an operating position;

guide means provided for said calender rolls to enable said calender rolls to be movable within a given mobility range defined between said rest position and said operating position;

lateral support means for supporting said guide means in substantially fixed relationship to said at least one rotatable winding roller;

said guide means comprising force-producing means for moving the calender rolls into said predetermined rest position thereof;

said force-producing means comprises at least one spring-pair containing two springs held apart from one another with a predetermined spacing; and

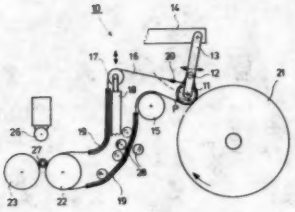
one end of the spring-pair being stationary and the end of the spring-pair which is held apart with the predetermined spacing being connected to one end of the calender roll whereby said connection contains at least a portion of the calender roll within said spring-pair.

4,637,566

METHOD AND APPARATUS FOR CONDUCTING THE END OF A WEB

Markku Kyytsönen, Numminen, Finland, assignor to Oy Wartsila AB, Finland

Filed Sep. 5, 1985, Ser. No. 772,682
Claims priority, application Finland, Sep. 7, 1984, 843526
Int. Cl.[4] B65H *18/16, 20/16, 27/00*
U.S. Cl. 242—56 R 22 Claims



10. Apparatus for conducting an end of a web from a machine roll through a subsequent web processing arrangement along a path defined by web guiding members, comprising:

fetching and gripping means for gripping the end of the web on the machine roll and for wrapping the web thereabout a desired number of turns;

conduction means for engaging the web and conducting the web in doubled-over form through the web processing arrangement with the web unwinding simultaneously both from the machine roll and from the fetching and gripping means; and

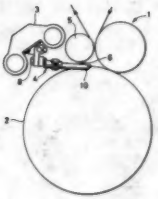
means for conveying said conduction means along a controlled path.

4,637,567

DEVICE FOR CONTINUOUSLY CUTTING AND WINDING A WEB

Keiji Tanaka, Kanagawa; Hatsuo Honryo, and Takeri Koga, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1983, Ser. No. 545,974
Claims priority, application Japan, Oct. 29, 1982, 57-163220[U]
Int. Cl.[4] B65H *19/26, 19/28;* B26D *1/08*
U.S. Cl. 242—56 R 4 Claims



1. A device for continuously cutting and winding a web, comprising:

a web winding roll;

a guide roll;

means for cutting a web movable in-between said web winding roll and said guide roll, said cutting means including a cutter blade made of an elastic metal plate, said cutter blade having a cutting edge and a flat portion; and

means for moving said cutter blade along an axial direction of said web winding roll, said cutter blade being mounted to said moving means such that at least a part of said flat portion of said cutter blade is maintained in elastic contact with an outer surface of said web winding roll behind said cutting edge while said cutter blade is moved along said axial direction.

4,637,568

MANDREL FOR WINDING FLEXIBLE METAL CATALYST CORE

Richard C. Cornelison, 6587 State Rte. 82, Hiram, Ohio 44234

Filed Jul. 30, 1985, Ser. No. 760,498
Int. Cl.[4] F01N *3/28*
U.S. Cl. 242—68.5 5 Claims

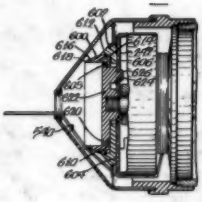
1. A mandrel for winding a thin metal catalyst support about its longitudinal axis, said mandrel having a circular central cross section and bilaterally extending arms along a common axis, each arm having an oval cross section continuously changing in a symmetrical manner along each arm, respectively, in a direction away from the circular central cross section to a terminal oval section having a final major and minor diameter, the major and minor diameters axially along one of said arms being angularly displaced from the major and minor diameters at corresponding axial positions along the other of said arms.

4,637,569

FEATHERING RING FOR FISHING REELS

Steven L. Swisher, Tulsa, Okla., assignor to Brunswick Corporation, Tulsa, Okla.

Filed Mar. 11, 1985, Ser. No. 710,608
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—84.2 A 6 Claims



1. In a fishing reel of the type having a front cover with a conically-shaped portion with an inside surface tapering forwardly to a line guide, a reel body having a deck plate, a center shaft extending through the reel in an axial direction, a spinner head assembly carried by the center shaft, crank drive means for rotating the center shaft and spinner head assembly to retrieve fishing line and means for selectively moving the center shaft and spinner head axially forwardly and rearwardly relative to the deck plate, line feathering structure comprising:

a deformable ring formed from a first material and having a forwardly facing edge and an annular, radially facing surface rearwardly of the edge;

means attaching the ring to the spinner head assembly to follow the axially forward and rearward movement of the center shaft and spinner head assembly;

said annular, radially facing surface situated in nonparallel relationship with the inside surface of the front cover with the feathering structure disengaged;

a line braking member formed from a second material and separate from the ring and having a surface engageable

with the inside surface of the front cover to trap the line against the inside surface of the front cover; and

means attaching the line braking member to the spinner head assembly to follow the axially forward and rearward movement of the center shaft and spinner head assembly;

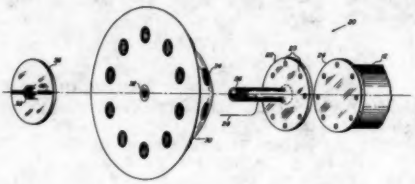
said annular, radially facing surface deforming and residing together with the surface of the line braking member against the inside surface of the front cover with the line braked at the initiation of a cast,

said first material being more deformable than the second material so that smooth progressive feathering of the line can occur as the ring is pressured against the inside surface of the front cover.

4,637,570
DRAG STABILIZER

Gregory N. Mitchell, St. Mary County, and Ronald A. Wilson, Calvert County, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Arlington, Va.

Filed Jan. 9, 1985, Ser. No. 689,890
Int. Cl.[4] F41J *9/08*
U.S. Cl. 244—1 TD **11 Claims**



1. A drag stabilizer for a towed cylindrical object which comprises:

a body having a shape with a diameter smaller in front than in back, having a hole along and through the longitudinal axis, having a plurality of holes parallel with the central hole and comprises a closed-cell foam with a density of not greater than about three pcf, a buoyancy of at least about 45 pcf, a tensile strength of at least about 40 psi, a tear strength of at least about 10 lb/in, and a water absorption of less than about one weight percent of total foam weight;

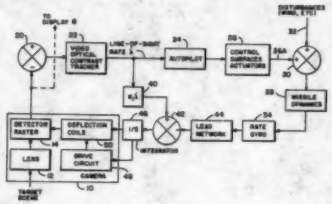
an attachment plate for rigidly attaching said body to said towed object, said plate comprising a plastic with a hardness from about 80 on the Durometer-A scale to about 120 on the Rockwell-R scale, an impact resistance of not less than about 500 J/m at 24° C. and of not less than about 45 J/m at 40° C., a tensile strength of not less than about 20 MPa at 24° C. and not less than about 15 MPa at 50° C., a specific gravity of not more than about 1.6, and a water absorption of not more than one weight percent after 24 hours submersion and said plate having a means for rigidly attaching said plate to said towed object and having a tube normal to one side for passing through said central hole of said body, thereby attaching said body to said towed object; and

a securing plate having a diameter less than the back diameter of said body, having a means for attaching to said tube of said attachment plate, thereby holding said body on said tube, and comprising a material similar to the material of said attachment plate.

4,637,571
ELECTRONIC IMAGE STABILIZATION

Donald W. Holder, Huntsville, and William R. Phillips, Hazlegreen, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 3, 1985, Ser. No. 771,751
Int. Cl.[4] F41G *7/22*
U.S. Cl. 244—3.16 **6 Claims**



1. In a target tracking system wherein a television image of a target is used for guidance of a missile toward the target, a method of compensating for undesirable missile body motion and providing a stable television image output from the television camera to the missile target tracker, comprising the steps of:

rigidly mounting a video camera to the missile body;

directing the camera lens along a field-of-view that is referred to the missile longitudinal axis;

deriving a television image of a target within the field of view;

sensing missile body disturbances;

providing missile pitch and yaw angular velocity signals in response to said disturbances;

processing said angular velocity signals;

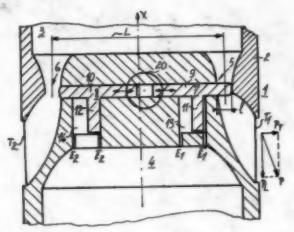
coupling said processed angular velocity signals to a television camera's vertical and horizontal deflection coils and;

moving the camera scanning raster of the television camera in the opposite direction of undesirable missile body motion for providing said stable image output to the missile target tracker.

4,637,572
GAS PROPELLOR FOR GUIDED MISSILE

Pierre Metz, Palaiseau, France, assignor to Thomson Brandt Armements, Paris, France

Filed Jan. 3, 1985, Ser. No. 688,638
Claims priority, application France, Jan. 6, 1984, 84 00172
Int. Cl.[4] F42B *15/033*
U.S. Cl. 244—3.22 **8 Claims**



1. Gas propulsion apparatus for a missile, comprising:

first and second nozzle means, disposed on substantially opposite sides of said missile, for providing thrust force passageways directed to a rear of said missile;

first and second valve means, movable with respect to each other and movably disposed in said first and second nozzle means respectively, for controlling thrust forces passing through said passageways; and

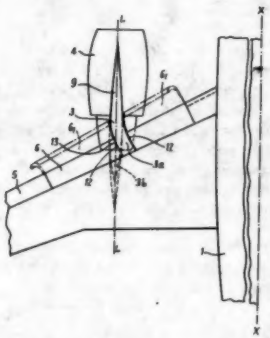
control means for controlling said first and second valve means to (a) prevent said first and second nozzle means from being closed simultaneously, and (b) cause said first and second nozzle means to assume one of three positions, in said first position said first nozzle means is open while said second nozzle means is closed, in said second position said first nozzle means is closed while said second nozzle means is open, and said third position both said first and second nozzle means are fully open.

4,637,573

ARROWLIKE AIRCRAFT WING EQUIPPED WITH A HIGH-LIFT SYSTEM AND WITH A PYLON FOR SUSPENDING THE ENGINE

Robert Perin, Pibrac; Pierre Jourdan, and Bernard Pauly, both of Blagnac, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 30, 1984, Ser. No. 676,867
Claims priority, application France, Dec. 6, 1983, 83 19480
Int. Cl.[4] B64D *29/02*
U.S. Cl. 244—54 **5 Claims**



1. An aircraft having a longitudinal axis and an aerodynamic pylon for suspending an engine nacelle below a wing of the aricraft, comprising:

(a) said wing having a leading edge, an upper surface and a lower surface, and said wing having a predetermined sweep angle with respect to said longitudinal axis of said aircraft;

(b) a high-light flap system arranged in said leading edge of said wing and comprising one flap which is displaceable orthogonally with respect to said leading edge between a retracted position and a high-lift out-spread position, said flap being housed inside said wing and forming part of said leading edge and the adjacent part of said upper surface in said retracted position, and said flap projecting forward from said leading edge in said high-lift out-spread position;

(c) said nacelle mounted below said lower surface and forwardly of said leading edge; and

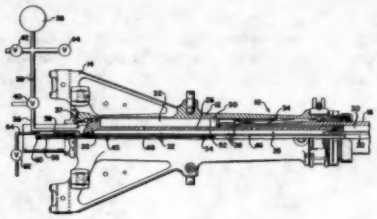
(d) said aerodynamic pylon having an oblong cross-section and being positioned such that the longitudinal axis of said cross-section is approximately parallel to said air-craft longitudinal axis, said aerodynamic pylon projecting forward from said leading edge of said wing and comprising a front edge joining up with said wing in the vicinity of the leading edge thereof and said aerodynamic pylon having an upper part adjacent said leading edge that is bent longitudinally inwardly toward said longitudinal axis of said aircraft, said upper part having a shape such that in said out-spread position and in any intermediate position between said out-spread and said retracted positions, the gap existing between said flap and said upper part is just enough to allow for the movement of said flap.

4,637,574

ATTENUATING, EXTENDIBLE SHOCK-ABSORBING STRUT

Roy R. Handwerk, Hicksville, N.Y., assignor to Menasco Inc., Burbank, Calif.

Filed Sep. 14, 1984, Ser. No. 650,608
Int. Cl.[4] B64C *25/60*
U.S. Cl. 244—104 FP **23 Claims**



1. A rapidly extendible, rough-field attenuating, shock-absorbing strut for use with an aircraft to provide angular or upward momentum to the aircraft during takeoff and to prevent damaging forces from being transmitted to the aircraft structure, said strut comprising an outer cylinder secured to said aircraft, an inner cylinder adapted for longitudinal reciprocation within said outer cylinder and having a wheel mounted adjacent an end thereof opposite said outer cylinder, a piston mounted for longitudinal reciprocation within both said outer and inner cylinders, said piston having a piston head on an end thereof opposite said inner cylinder, said piston head being adapted for reciprocation within said outer cylinder, means for applying fluid pressure between the outer cylinder and said piston head to cause said piston to move longitudinally toward said inner cylinder and means in association with said piston and inner cylinder for moving said inner cylinder longitudinally and away from said aircraft and outer cylinder when said piston moves longitudinally toward said inner cylinder, whereby an angular or upward momentum is provided to said aircraft.

4,637,575

HELICOPTER AIRMOBILE WORK PLATFORM FOR WORKING ON POWER LINES AND TOWER STRUCTURES

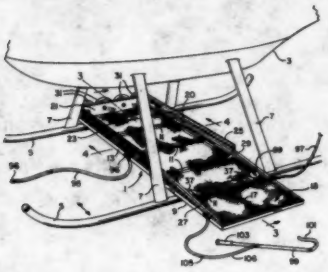
Scott H. Yenzer, 1145 Asturia Ave., Coral Gables, Fla. 33134

Filed Oct. 4, 1984, Ser. No. 657,492
Int. Cl.[4] B64D *11/00*
U.S. Cl. 244—118.5 **23 Claims**

1. A work platform adapted for attachment to a pair of helicopter skid tubes that extend longitudinally beneath a helicopter fuselage, substantially parallel to each other, for supporting a workman working on high-voltage power lines comprising;

a rectangular base having a length along its major axis

greater than the distance between the helicopter skid tubes, said base including a workman support portion;



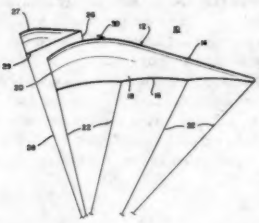
attachment means for directly attaching said base to each of the helicopter skid tubes such that at least one skid tube is capable of lateral movement with respect to the base.

4,637,576

PARACHUTE WITH LEADING-EDGE SLATS

Michael J. Ravnitzky, Peekskill, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,444
Int. Cl.[4] B64D *17/02, 17/14*
U.S. Cl. 244—145 9 Claims



1. A parachute, comprising:

an inflatable canopy structure defining a leading-edge;

a plurality of suspension lines connected at spaced locations to the canopy;

at least one slat structure having a leading edge, a trailing edge and top and bottom surfaces between the leading edge and the trailing edge for directing airflow and producing lift;

means for attaching said at least one slat structure to the canopy structure; and

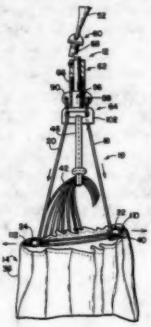
means for deploying each slat structure so that the leading edge thereof is located forward of and/or above the leading-edge of the canopy structure, said means for deploying including a suspension line attached to the bottom surface of the slat structure at approximately the leading edge thereof and a stow line attached to the bottom surface of the slat structure at approximately the trailing edge thereof and to the upper canopy wall.

4,637,577

DISCARD ASSEMBLY FOR PARACHUTE DEPLOYMENT MECHANISM

George Miseyko; Walter R. Peck, both of Asheville, and Ronald G. Chase, Arden, all of N.C., assignors to Stencel Aero Engineering Corp., Arden, N.C.

Continuation of Ser. No. 593,862, Mar. 27, 1984, abandoned.
This application Apr. 29, 1986, Ser. No. 858,839
Int. Cl.[4] B64D *17/62*
U.S. Cl. 244—147 18 Claims



1. In a parachute deployment assembly including a closed parachute packed in a container, a deployment mechanism for extracting the parachute from the container, and a discard assembly for discarding the deployment mechanism from the parachute, the improvement comprising:

means, coupled to the parachute and to the discard assembly, for actuating the discard assembly in response to the transverse opening of the parachute by a preselected amount,

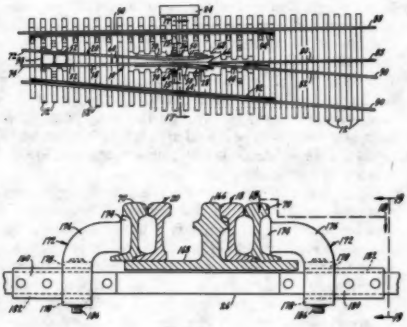
said means for actuating including means for transmitting the force generated by the transverse expansion of the parachute to the discard assembly.

4,637,578

RAILROAD FROG HAVING MOVABLE WING RAILS

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,488
Int. Cl.[4] E01B *7/14*
U.S. Cl. 246—391 7 Claims



1. In a railroad frog of the type having movable wing rails hinged for lateral movement at a predetermined point and actuated by a throw rod which extends in a horizontal direc-

tion beneath the rails and transverse to the vertical axes of the wing rails, the improvement comprising swivel clips for pivotally connecting the throw rod to the wing rails and for resisting rolling action of the wing rails about their bases, the swivel clips comprising:

a bar connected to a wing rail;

an arm connected to the bar and extending downwardly to a point adjacent the throw rod;

a clevis attached to the arm;

a pin block attached to the throw rod; and

a pin pivotally connecting the clevis and pin block, said pin block having an elongated sleeve portion complementally fitting a portion of the throw rod beyond the connection of the arm to the throw rod in an axial direction of the throw rod.

4,637,579

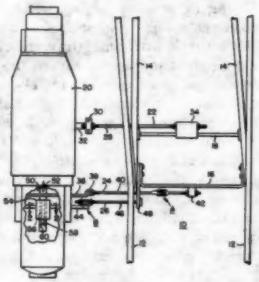
RAILROAD SWITCH MECHANISM

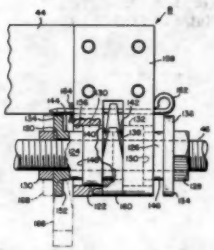
Russell M. Hartung, Webster, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 465,402, Feb. 10, 1983, abandoned. This application Apr. 23, 1985, Ser. No. 726,913

Int. Cl.⁴ E01B 7/00

U.S. Cl. 246—452 **7 Claims**





1. A control assembly for a railroad switch mechanism having a switch machine and a railroad track switch connected thereto via said control assembly, which control assembly avoids the need for readjustments after testing, said control assembly comprising a rod assembly movable with said track switch and providing a rigid connection beween said track switch and said switch machine of adjustable length, coupling means in said rod assembly having an opening, a member removable from and replaceable in said opening for releasing said connection so that the adjustment of said connection established by said rod assembly upon replacement of said member in said opening is quickly reestablished thereby reducing the time required for testing to verify the operation of said track switch, said rod assembly being provided by a detector rod assembly, said detector rod assembly comprising a detector connector rod connected at one end thereof to the switch points of said track switch and via said releasing member to the detector bar of said switch machine, said coupling means including a collar having an annular groove defining said opening, said connector rod being connected to said collar, means retaining said collar in longitudinal sliding relationship therewith, and a replaceable retaining member disposed in said groove and engageable with said retaining means for releasing said collar and connector rod for sliding movement when removed from said groove and maintaining said rigid connection when disposed in said groove.

4,637,580

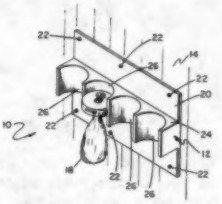
FOOD STORAGE DEVICE

Paul H. Idstein, 506 Stuart, Grayslake, Ill. 60030

Filed Oct. 3, 1985, Ser. No. 783,455

Int. Cl.⁴ A47F 5/08

U.S. Cl. 248—95 **5 Claims**



1. Apparatus for resealing a foodstuff container of the bag variety about its neck and releasably supporting said container from a preselected location, comprising:

a closing assembly means for releasably resealing said container about said neck including:

a cavity internal of said assembly means for receiving a portion of said neck;

closing means pivotable about a first end for forcing a portion of said neck into a portion of said cavity whereby said neck portion and said closing means are retainedly and releasably held within said portion of said cavity in a press-fit;

a storage rack means for releasably supporting said closing assembly means; wherein

said first end of said closing means is internal to said closing assembly means;

said cavity is formed about a central longitudinal axis;

said closing means includes a second end extending radially outwards of said axis;

said closing assembly means further includes

pin means for interconnecting said closing means in said pivotable relation about said first end; and

said closing means further includes a second end pivotable about said first end whereby said closing means moves in a plane intersected by said axis when moving between a first and second position;

when said closing means moves between said first and second positions a portion of said closing means moves in a cross-sectional area defined by a plane intersected by said axis and intersecting said cavity;

said storage rack means defines a rack aperture for slidably and releasably receiving and retaining a portion of said closing assembly means;

said closing assembly means further defines a slot in communication with said cavity; and

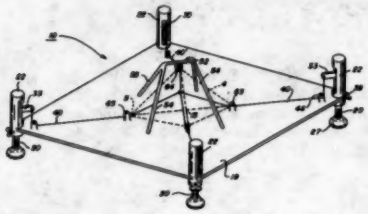
a portion of said closing means extends through said slot and radially outwards thereof whereby a portion of said closing means moves along said slot when said closing means is moved between said first and second positions.

4,637,581

FOUR POINT SUPPORT FOR COPIERS AND THE LIKE

Lam F. Wong, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1985, Ser. No. 777,482
Int. Cl.[4] F16M 11/24
U.S. Cl. 248—188.3 5 Claims



1. A four-point support for easy leveling a load comprising:

first, second, third and fourth support means for the load, said support means being located at the corners of a quadrilateral, said support means being adapted to bear on a supporting surface at four points for supporting the load above said surface;

each support means having an individual connection with the load for transmission of force from the load to said supporting surface, each support means being movable,

the first and third support means being located at two opposite corners of the quadrilateral and the second and fourth support means being located at the other two opposite corners of the quadrilateral,

first means interconnecting said first support means to a common point for transmitting force from said first support means to said common point on movement of said first support means in one direction and for transmitting force from said common point to said first support means on movement of said common point in the opposite direction;

second means interconnecting said second support means to said common point for transmitting force from said second support means to said common point on movement of said second support means in one direction and for transmitting force from said common point to said second support means on movement of said common point in the opposite direction;

third means interconnecting said third support means to said common point for transmitting force from said third support means to said common point on movement of said third support means in one direction and for transmitting force from said common point to said third support means on movement of said common point in the opposite direction; and

fourth means interconnecting said fourth support means to said common point for transmitting force from said fourth support means to said common point on movement of said fourth support means in one direction and for transmitting force from said common point to said fourth support means on movement of said common point in the opposite direction;

said common point laying within a tetrahedron;

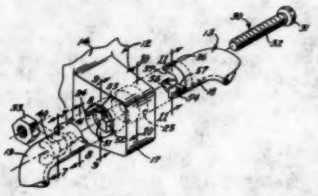
said fourth means passing through the apex of said tetrahedron.

4,637,582

TOWEL RING ASSEMBLY

John W. Boda, Roscoe, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Jan. 13, 1986, Ser. No. 818,218
Int. Cl.[4] A47F 5/00
U.S. Cl. 248—315 14 Claims



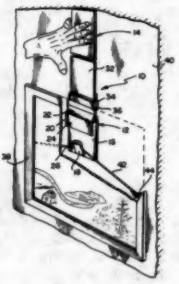
1. A towel ring assembly comprising, in combination, a base having a rear surface adapted to be attached to a wall or the like, a forwardly extending projection on said base and formed with a generally horizontal hole having an axis extending generally parallel to the wall, a split ring having first and second end portions spaced from one another, and located on opposite laterally facing sides of said projection, a fastener assembly comprising a nut and comprising a screw having a head and having a shank extending through said hole and threaded into said nut, first and second ears on the rear sides of the first and second end portions, respectively, of said ring, said first ear being located between said head and one side of said projection in opposing engagement with said head and receiving a portion of said shank, and said second ear being located between said nut and the opposite side of said projection in opposing relation with said nut and receiving another portion of said shank whereby tightening of said fastener assembly causes said head and nut to bear against said ears and to draw the ends of said ring toward said projection while permitting said ring to swing relative to said projection.

4,637,583

DEVICE FOR POSITIONING PICTURE HANGERS ON A WALL SURFACE

Jeffrey M. Babitz, P.O. Box 805, West Dover, Vt. 05356

Filed Dec. 31, 1984, Ser. No. 687,593
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—544 12 Claims



1. A device for positioning pictures and like articles in selected locations for hanging upon a wall, said device comprising:

a hanger member having a flat body plate and at least one nail chute projecting from the front surface of said body plate, said nail chute being sized and positioned to suspend therefrom a support member on the rear of the article to be hung, said nail chute being formed integrally with said hanger member,

an elongated locator member having a length appreciably

greater than the length of said hanger member, said elongated locator member being flexible,

means for detachably coupling said locator member to the upper end of said hanger member with said locator member extending upwardly from said hanger member, whereby when said article to be hung is suspended on said hanger member, said locator member extends above the top of said article in a position to be grasped for locating said article in a selected position on said wall, and

adhesive means on the rear surface of said body plate for temporary attachment of said hanger member on said wall in said selected position.

4,637,584

POWER UNIT MOUNT ASSEMBLY

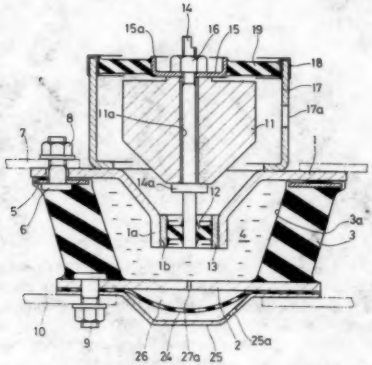
Shin Takehara, Machida, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 11, 1985, Ser. No. 722,713

Claims priority, application Japan, Apr. 11, 1984, 59-71005

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—559 **11 Claims**



1. A fluid-containing power unit mount assembly comprising a first upper base plate secured to a power unit and a second lower base plate secured to a vehicle body and an elastic member secured between the first and second base plates to define with the elastic member, the first upper base plate and the second lower base plate an inner space forming a first fluid chamber which encloses a fluid; wherein the first upper base plate is provided with an aperture, which aperture is blocked by a second elastic member on which is mounted a mass body.

4,637,585

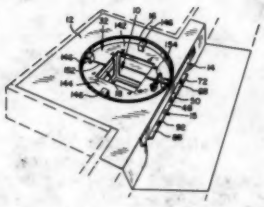
REUSABLE CONCRETE CURB INLET FORM

August J. Picollo, 628 Beebe Rd., Central Point, Oreg. 97501

Filed Apr. 15, 1985, Ser. No. 723,613

Int. Cl.⁴ B28B *7/30*; **E01C** *19/50*; **E02D** *29/12*

U.S. Cl. 249—10 **16 Claims**



1. A reusable concrete crub inlet drain form for forming a curb inlet drain for a catch basin comprising:

a central key section means having a top, a bottom, and sides;

plural curb inlet drain forming means detachably mounted to the sides of the central key section for forming the upper portion of a curb inlet drain;

the curb inlet drain forming means each including a rear wall for detchable mounting to a side of the key section means, a shelf which is generally horizontal, a flange projecting downwardly from a outer edge of the shelf, and a neck segment flange projecting upwardly from the shelf; and

the curb inlet drain forming means including means for forming a drain inlet opening leading to the catch basin.

4,637,586

FORM FOR PRODUCING CONCRETE RAILS

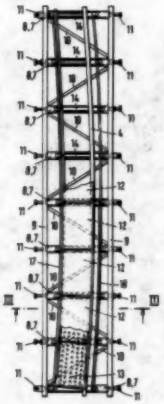
Werner Fastenau, Esslingen-Rüdern, Fed. Rep. of Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 806,261

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444896

Int. Cl.⁴ B28B *7/04*

U.S. Cl. 249—159 **6 Claims**



1. A form for producing concrete rails having a horizontal tread and a vertical guide portion for track-guided, rubber-tired vehicles, said form comprising:

a frame which is provided with a first side;

at least one first support and at least one second support, with said second support being adjustably connected to said first side of said frame;

a sheathing having a first end and a second end;

a first lateral sheathing having a first end which is connected to said second end of said sheathing;

a second lateral sheathing having a first end which is connected to a second end of plate members;

a guide portion sheathing which is provided with a first end and a second end, with said second end being positioned at substantially right angles to said first end of said first lateral sheathing and being connected to said first support, and with said guide portion sheathing being continuous and extending along the entire length of said form, and with said guide portion sheathing being capable of being adjustably curved by shifting of said first and said second supports; and

a tread sheathing which is provided with said plate members and a resilient covering, with said plate members being separated from one another by a gap and with said plate members being arranged adjacent one another following the longitudinal direction of said form, and with said plate members being provided with a side remote from said first support, wherein said last-mentioned sides of said plate members are connected by said covering which thereby bridges said gaps and forms a flat shuttering surface, and with a first end of one of said plate members being con-

nected to said first end of said guide portion sheathing forming substantially at right angle therewith.

4,637,587

FACILITY FOR THE MONITORING OF PHYSICAL QUANTITIES ON SYSTEMS

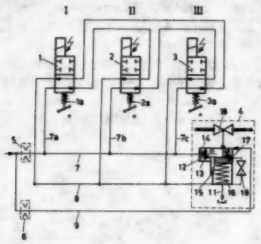
Klaus Kühnlein, Glattbrugg, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jul. 12, 1985, Ser. No. 754,217

Claims priority, application Switzerland, Jul. 20, 1984, 3544/84

Int. Cl.⁴ F16K *31/02;* **F01B** *25/16;* **F01D** *21/00*

U.S. Cl. 251—29 **7 Claims**



1. An apparatus for the monitoring of physical quantities on systems, said apparatus comprising:

(a) a quick closing valve comprising:

(i) first, second, and third chambers;

(ii) a first path of fluid communication from said first chamber to said third chamber through said second chamber;

(iii) first valve means for closing said first path of fluid communication in response to an increase in pressure in said second chamber to a value about a first predetermined value;

(iv) a drain to tank in fluid communication with said third chamber; and

(v) second means for actuating a through-flow valve in response to an increase in pressure in said first chamber to a value above a second predetermined value;

(b) a second path of fluid communication for supplying fluid under pressure to said second chamber;

(c) a third path of fluid communication for supplying fluid under pressure to said first chamber;

(d) first, second, and third four-way solenoid valves;

(e) a fourth path of fluid communication for conducting fluid under pressure from said second path of fluid communication through first said first four-way solenoid valve and then through said second four-way solenoid valve to tank;

(f) a fifth path of fluid communication for conducting fluid under pressure from said second path of fluid communication through first said second four-way solenoid valve and then through said third four-way solenoid valve to tank; and

(g) a sixth path of fluid communication for conducting fluid under pressure from said second path of fluid communication through first said third four-way solenoid valve and then through said first four-way solenoid valve to tank, whereby:

(h) when said fourth, fifth, and sixth paths of fluid communication are all open, the pressure in said second chamber does not reach said first predetermined value, said first valve means remains open, the pressure in said first chamber remains beneath said second predetermined value, and said through-flow valve remains un-actuated;

(i) when one of said fourth, fifth, and sixth paths of fluid communication is closed and the other two of said fourth, fifth, and sixth paths of fluid communication are both open, the pressure in said second chamber does not reach said first predetermined value, said first valve means remains open, the pressure in said first chamber remains beneath said second predetermined value, and said through-flow valve remains un-actuated; and

(j) when at least two of said fourth, fifth, and sixth paths of fluid communication are closed, the pressure in said second chamber reaches a value above said first predetermined value, said first valve means closes, the pressure in said first chamber reaches a value above said second predetermined value, and said through-flow valve is actuated.

4,637,588

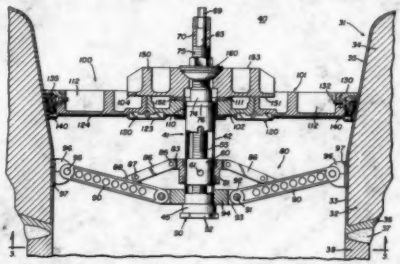
NON-BOLTED RINGLESS NOZZLE DAM

John J. Wilhelm, New Kensington; Gregory L. Calhoun, Allegheny Township, Blair County; Paul H. Dawson, Plum Borough, and Arthur W. Kramer, Franklin Township, Armstrong County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1984, Ser. No. 605,354

Int. Cl.⁴ F16K *31/44;* **F16L** *55/12*

U.S. Cl. 251—280 **27 Claims**



1. A foldable nozzle dam for preventing fluid flow through a primary fluid nozzle and the plenum of a nuclear steam generating vessel, said nozzle dam comprising: fluid-impermeable seal means including a plurality of hingedly interconnected sections foldable between a relatively compact access condition facilitating insertion into the steam generating vessel and an expanded sealing condition, said seal means in the sealing condition thereof being disposable within and extending across the nozzle for closing same in frictional engagement with the inner surface of the nozzle around the entire perimeter thereof to form a fluidtight seal; and anchor means separable from said seal means and movable between a relatively compact access configuration for facilitating insertion into the vessel and an expanded anchoring configuration, said anchor means including a base member disposed centrally of the nozzle, a plurality of anchor members pivotally mounted on said base member at equiangularly spaced apart points therearound for pivotal movement between the access and anchoring configurations of said anchor means, an elongated shaft extending axially of the nozzle and coupled at one end thereof to said base member, a collar member disposed in surrounding relationship with said shaft and movable longitudinally thereof, and linkage means interconnecting said anchor members and said collar so that as said collar moves toward said base member said anchor members are urged in an expanding direction, said anchor means being adapted for coupling to said seal means and radially frictionally engageable in its anchoring configuration with the inner surface of the nozzle securely to hold said seal means in its sealing condition.

4,637,589

BI-SECTION ADJUSTABLE CONNECTOR BRIDGING AN OPENED HANDRAIL

Ta C. Lin, 8, Lane 4, Pei Jung Street, Chiayi City, Taiwan

Filed May 16, 1985, Ser. No. 734,703

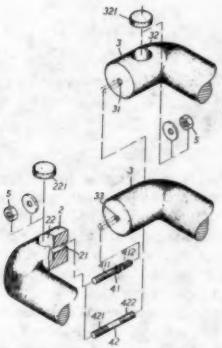
Int. Cl.⁴ E04H *17/14*

U.S. Cl. 256—59 **4 Claims**

1. A device for joining two L-shaped component bars for a stairway railing, comprising:

a first and a second L-shaped component bar, both said first and second component bars defining a horizontally extending opening at one end thereof, and said first component bar also defining a vertically extending opening extending radially from the exterior of said first bar and intersecting said horizontally extending opening in said first component bar;

a bolt means having two ends and threaded at least one end thereof for insertion of said bolt ends within said horizontally extending openings of both said first and second



component bars and thereby joining said first and second component bars, said threaded end terminating within said vertically extending opening, and being of a smaller diameter than said horizontally extending opening in said first bar;

a nut means fitting within said vertically extending opening for screwing onto said threaded end of said bolt means to thereby tighten said joining;

lid means for plugging the exterior of said vertically extending opening.

4,637,590

METHOD AND APPARATUS FOR OPENING AND CLOSING A TAPHOLE IN FURNACES

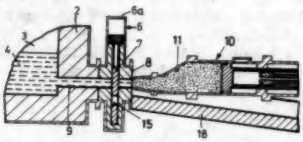
Werner Schneider, Biedenkopfer Strasse 16, D-5900 Siegen 1, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,988

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443143

Int. Cl.⁴ C21B 7/12

U.S. Cl. 266—45 **2 Claims**



1. A method for the alternating opening and closing of a taphole in furnaces having high internal pressure, comprising the following process steps:

sealing the taphole duct by a closure member;

deploying a plugging gun at the opening of the taphole duct,

reopening the closure member, and

immediately after reopening the closure member, completely filling the taphole duct with plugging compound by means of the plugging gun.

4,637,591

DROSS COOLER AND PROCESSOR

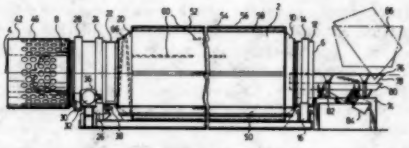
J. Philip McMahon; Han Spoel, and John McGinley, all of 1087 Meyerside Dr., Units 12 and 13, Mississauga, Ontario, Canada

Filed Jun. 13, 1985, Ser. No. 745,244

Claims priority, application Canada, Jun. 22, 1984, 457307

Int. Cl.⁴ C22B 7/04

U.S. Cl. 266—165 **7 Claims**



1. Dross treatment apparatus comprising:

a drum having a cylindrical shell mounted to rotate about a substantially horizontal axis,

means to rotate said drum about said axis,

an inlet opening at one end of said drum,

said axis being inclined downwardly towards said outlet end at between 0 and 2 degrees from the horizontal,

means to feed dross to the inside of said drum through said inlet opening,

a series of flights at spaced intervals located on the inside surface of said drum shell adapted to tumble the dross therein upon rotation of said drum,

means to remove said tumbled dross from said drum through said outlet opening,

said inlet and outlet openings including a truncated cone extending from the respective end of said shell of said drum radially inwardly and longitudinally beyond the said end of said shell to form an opening of smaller diameter than said drum.

4,637,592

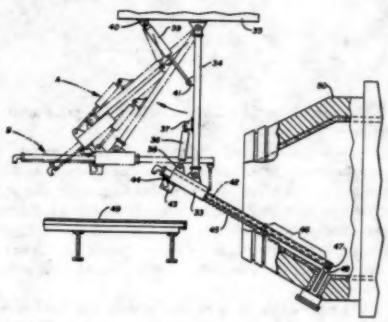
ELEVATED SWINGING DEVICE FOR PLACING SLAG RETENTION DEVICES IN TAPPING CONVERTERS

Michael D. La Bate, II, Ellwood City, and Joseph A. Perri, Coraopolis, both of Pa., assignors to Insul Company, Inc., East Palestine, Ohio

Continuation-in-part of Ser. No. 643,499, Aug. 23, 1984, Pat. No. 4,553,743. This application Jun. 24, 1985, Ser. No. 747,799

Int. Cl.⁴ C21B 5/46

U.S. Cl. 266—272 **3 Claims**



1. Apparatus for placing a slag retaining device in a tap hole in a converter comprising a two-part boom extensible into said converter, a swingable support member pivotally attached at a top end thereof to and suspended from an overhead support structure, extensible means attached at one end to said over-

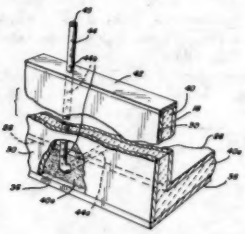
head support structure and at another end to said swingable support member at a location spaced from said swingable support member top end for moving said swingable support member, in a vertical plane on a first arcuate path based on said pivotal attachment to said overhead support structure from a first vertical position adjacent said converter to a second angular position away from said converter, a tubular device pivotally positioned on a lower end of said swingable support member, one part of said two-part boom being positioned in said tubular device, means on said tubular device for moving said one part of said boom telescopically with respect to said tubular device, extendable means having one end attached to said swingable support member and another end attached to said tubular device for moving said tubular device in a second arcuate path in said vertical plane based on said pivotal attachment of said tubular device to said swingable support member, means on one end of the other part of said two-part boom for detachably engaging said slag retaining device, said slag retaining device moving in said vertical plane and remaining in said vertical plane during storage whereby said slag retaining device can be oriented to be aligned with the converter tap hole and moved into and out of a tap hole plugging position without disturbing that alignment and can be in a stored condition above an operating floor while remaining aligned with the tap hole.

4,637,593

LADLE CUP FOR POURING MOLTEN METAL

Richard H. Yinko, Sr., 1377 Kings Ct., Sheboygan, Wis. 53081

Filed Aug. 9, 1985, Ser. No. 764,103
Int. Cl.[4] C21B *3/00*
U.S. Cl. 266—275 **10 Claims**



1. A submersible ladle for transporting and pouring metal comprising:

A. at least first and second one piece cup-shaped metal shells nested one within the other to form the respective interior and exterior retainer wall surfaces of the ladle and sealed to one another with sealing strips connecting the respective edges of said shells;

B. a vented refractory material layer sandwiched between at least portions of the shells to provide heat insulation therebetween;

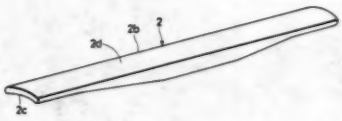
C. said layer having at least one venting conduit for heat, said conduit extending into said layer and communicating with ambient atmosphere for accelerated transfer of heat conducted from said molten metal through said retaioner wall surfaces to ambient atmosphere thereby substantially decreasing degradation of said shells due to heat from said molten metal.

4,637,594

LEAF SPRING CONSTRUCTION

Tsutomu Saito, Chiba; Yoshimichi Hasegawa, Aichi; Kazuo Yoshikawa, Aichi, and Shigetsune Aoyama, Aichi, all of Japan, assignors to Horikiri Spring Mfg. Co., Ltd.; Aichi Steel Works, Ltd. and Kabushiki Kaisha Toyota Chuo Kenkyusho, all of, Japan

Filed Oct. 28, 1982, Ser. No. 437,394
Claims priority, application Japan, Oct. 29, 1981, 56-174051
Int. Cl.[4] F16F *1/18*
U.S. Cl. 267—47 **13 Claims**



1. A leaf spring comprising: a single spring steel plate adapted to undergo bending deformation in a direction perpendicular to the length and parallel to the thickness thereof;

a center portion of said plate in the lengthwise direction thereof having a constant maximum thickness, the thickness gradually decreasing toward opposite ends of the plate to form tapered portions;

at least said tapered portions having an arcuate shape in transverse cross-section, with a convex surface on a tension side and a concave surface on a compression side thereof, said convex and concave surfaces being defined by an arc of substantially the same radius over the entire width thereof, respectively, and said arcuate shape satisfying the relation:

$$2.0 \geq r_c/b \geq 0.64$$

where b is the width of said plate and r_c is the radius of a transverse center line of said plate; and

said tapered portions satisfying the relation:

$$0.03 \geq \Delta t/l \geq 0.005,$$

where l is the length of each said tapered portion and at is a difference in thickness between opposite ends of each said tapered portion;

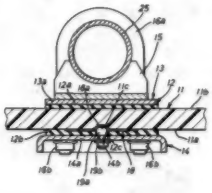
thereby providing a single tapered spring with a reduced weight as well as both flexual rigidity and fatigue strength improved per unit weight of the leaf spring.

4,637,595

LEAF SPRING ASSEMBLY

Yasuhiro Mishima; Katsunori Makibayashi, both of Toyota, and Kiyoaki Kuwayama, Nagoya, all of Japan, assignors to Toyota Jidoshu Kabushiki Kaisha and Chuohatsujyo Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 26, 1984, Ser. No. 624,738
Int. Cl.[4] F16F *1/26*
U.S. Cl. 267—52 **3 Claims**



1. A leaf spring assembly comprising:

a longitudinal leaf spring made of fiber reinforced plastics having a length in the longitudinal direction, said leaf spring having a first surface to be applied with a tension force and a second surface to be applied with a compression force, said leaf spring being provided only on the second surface thereof with a recess which is located substantially at the central longitudinal portion of said leaf spring;

a pair of retainer plates attached to the first and second surfaces of said leaf spring;

means for clamping said retainer plates to said leaf spring and mounting the same on an axis housing;

a metallic seat plate formed with a protruded portion coupled with the recess of said leaf spring and secured to the second surface of said leaf spring; and

a position pin fixed to said retainer plate attached to the second surface of said leaf spring, said position pin being coupled with the recess of said leaf spring through the protruded portion of said seat plate to position said retainer plates substantially at the central longitudinal portion of said leaf spring, said position pin being in the form of a bolt having a head engaged with the protruded portion of said seat plate and being fastened to said retainer plate by a nut threaded thereto.

4,637,596

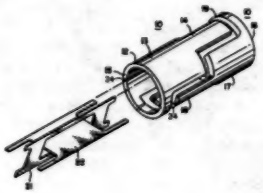
STRUCTURAL CORE PIVOT

Richard J. Lewis, New Hartford, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 4, 1985, Ser. No. 784,148

Int. Cl.⁴ F16F *3/02*

U.S. Cl. 267—160 **12 Claims**



1. A flexural pivot comprising:

a first member having a circumferentially extending larger outer diameter arcuate portion extending more than 180° and a reduced outer diameter arcuate portion of less than 180° extending therefrom;

a similarly shaped second member disposed on the same longitudinal axis as said first member with its reduced outer diameter portion extending between the circumferentially spaced apart ends of the larger diameter portion of said first member; and

spring means for connecting said first member and said second member permitting relative rotational movement.

4,637,597

LOCKING POWER CLAMP

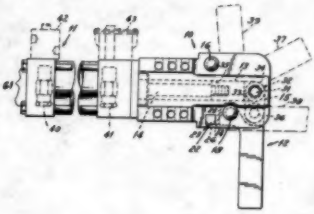
Alexander W. McPherson, Farmington, Mich., and Hazem N. Hamed, Torrance, Calif., assignors to De-Sta-Co Division/-Dover Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 427,176, Sep. 29, 1982, Pat. No. 4,458,889. This application Jul. 6, 1984, Ser. No. 628,244

Int. Cl.⁴ B23Q *3/03*; B25B *1/04*

U.S. Cl. 269—32 **14 Claims**

1. Toggle clamp comprising clamp arm means, manual actuating arm means, pivoted toggle linkage means interconnecting said clamp arm and said actuating arm means, including antifriction pivotal bearing means with rolling elements minimizing the ratio of actuating arm to clamp arm forces in locking and unlocking clamp arm pressure within the operational capacity of the clamp, and stop means limiting said actuating arm movement to a locked clamping position of said toggle linkage means, said toggle linkage means including said antifriction pivotal bearing means at each of four parallel spaced



axis pivotal connections, and including central clamp bar, and bifurcated base, side link, and handle elements, one of said pivotal connections extending between said bar and base, a second between said bar and side link a third between said base and handle, and a fourth between said handle and side link elements.

4,637,598

HOLDER FOR A STACK OF SHEETS

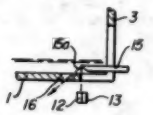
Jan M. M. Bouwens, Kessel, and Hendrik E. P. Schiffelers, Simpelveld, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Jul. 12, 1985, Ser. No. 755,197

Claims priority, application Netherlands, Jul. 27, 1984, 8402365

Int. Cl.⁴ B65H *7/14*

U.S. Cl. 271—3.1 **8 Claims**



1. A holder for a stack of sheets in a sheet processing machine, wherein the sheets to be processed are fed from one end of the stack out of the holder, said holder comprising:

(a) at least a separating means movable between an inoperative position in which it is not in contact with a stack in the holder and an operative position in which it can engage between sheets of the stack; and

(b) a light source and a light-sensitive detector positioned below said stack, wherein said separating means and a fixed part of the holder are each provided with a light-reflecting surface for reflecting light from said light source in the direction of the detector when the separating means is in the operative position and in the absence of sheets between the separating means and the detector, and when the separating means is in the inoperative position and in the absence of sheets in the holder.

4,637,599

SUCTION-LIFTING CONVEYOR FOR TRANSFER FOR SHEET-SHAPED OBJECTS

Matti V. Eerola, Sairakkala, Finland, assignor to Raute Oy, Lahti, Finland

Filed Oct. 3, 1985, Ser. No. 783,955

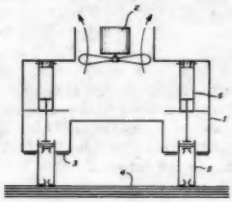
Claims priority, application Finland, Oct. 12, 1984, 844029

Int. Cl.⁴ B65H *3/12, 3/44, 5/22*

U.S. Cl. 271—5 **5 Claims**

1. Suction-lifting conveyor for the transfer of sheet-shaped

objects, in particular of sheets of plywood veneer, one by one from a stack to further processing or to another stack, which said device comprises a box-shaped suction-channel equipment extending substantially over the entire length and width of the conveyor, blower means for maintaining a negative pressure in the suction-channel equipment, at least one endless belt performing the transfer of the sheets and running substantially horizontally above the stack or stacks of sheets, the said at least one belt being arranged so that during the transfer movement it runs against the outside of the bottom face of the suction-channel system, being subject to the effect of the negative pressure in the suction-channel equipment, and that during their return movement they run in the suction-channel system, wherein at the transfer side of the conveyor belt, in immediate



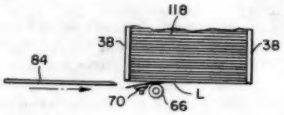
proximity of the running zone of the belt, above each stack of sheets, at least one suction box is provided whose bottom face can be lowered onto the stack of sheets and, correspondingly, whose bottom face can be raised at least to the level of the transfer side of the conveyor belt, said suction-channel equipment being substantially closed to effect said negative pressure maintenance but having means at said bottom face for slidably receiving said suction box while maintaining a suction effect in said suction box, and means defining at least one suction flow slot in said bottom face adjacent said suction box and extending in the direction of travel of said at least one belt, the said suction box being connected to the suction-channel equipment so as to produce said suction effect at the suction flow slot at the bottom face of the suction box.

4,637,600

LABEL SEPARATOR

George F. Bartimes, Chicago, and Leonard A. Blomquist, Joliet, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Feb. 8, 1982, Ser. No. 346,817
Int. Cl.[4] B65H *3/32, 3/40*
U.S. Cl. 271—93 **6 Claims**



5. Apparatus for separating a foremost label from all other labels of a stack of labels, said apparatus comprising displacing means for displacing at least an edge portion of a foremost label from all other labels of a stack, and separator means for thereafter moving between the foremost label and the remaining labels in the stack starting at said edge portion, said displacing means including a suction head mounted for movement in a direction of label dispensing from a label stack, and suction control means for controlling the application of suction to said suction head, said suction control means including means responsive to the position of said separator means.

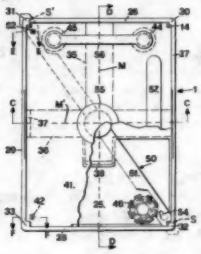
6. A method of assuring the dispensing of a single label from a stack, said method comprising the steps of displacing an edge of a label from the remainder of the stack, and then inserting a separator between the label and the stack starting at the edge, the displacing step utilizes a suction head, and the application of suction to the suction head is controlled by the position of the separator.

4,637,601

CASSETTE FOR A SHEET FEED DEVICE

Jorge Costa, and Wolfgang Reichel, both of Yverdon, Switzerland, assignors to Hermes Precisa International S.A., Switzerland

Filed Jun. 1, 1984, Ser. No. 616,147
Claims priority, application Switzerland, Jun. 3, 1983, 3058/83
Int. Cl.[4] B65H *1/12*
U.S. Cl. 271—160 **8 Claims**



1. A cassette intended to hold a stack of sheets to be printed, said cassette and sheets of rectangular configuration and having major and minor axes respectively extending along their length and width, said cassette comprising a rectangular shaped bottom and first and second longest side walls parallel to said major axis and first and second shortest side walls parallel to said minor axis, said cassette adapted to be selectively inserted into a sheet feed device or printer to deliver said sheets thereto in a direction parallel either said major or said minor axis, upper edge holding elements disposed on said first longest side wall and said first shortest side wall to hold the sheets in the cassette, a support plate within said cassette supporting the stack of sheets, selected ones of a plurality of elastic elements pushing said support plate and sheets to urge a first edge of the sheets against said holding elements on said first shortest side wall so that the sheets elastically engage at said first shortest side wall with a removal and transport mechanism of the sheet feed device, selected ones of a plurality of elastic elements adapted to push said support plate and sheets to urge a second edge of the sheets against the holding elements on said first longest side wall so that the sheets elastically engage at said first longest side wall with a removal and transport mechanism of the sheet feed device, and a locking mechanism intended to hold said support plate against the bottom approximately in the vicinity of either said second shortest side wall when the sheets are to be delivered in a direction parallel to said major axis or in the vicinity of said second longest side wall when the sheets are to be delivered in a direction parallel to said minor axis.

4,637,602

DOCUMENT GUIDE APPARATUS FOR PREVENTING JAMS

Thomas J. Gavaghan, Norwalk; Paul D. Boucher, Sandy Hook, and Karel Janatka, Southbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 9, 1985, Ser. No. 806,870
Int. Cl.[4] B65H *9/00*
U.S. Cl. 271—238 **6 Claims**

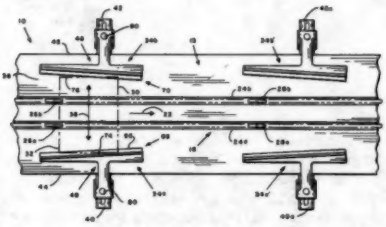
1. In an envelope inserting machine having an elongate feed

deck, means for advancing insert material to be inserted into envelopes along said feed deck, and a plurality of insert material feeding devices spaced along said feed deck for sequentially feeding insert material onto said feed deck in registration with insert material advancing along said feed deck, registration devices for said insert material, said registration devices comprising:

a. a plurality of support members connected to said feed deck and extending laterally outwardly from said feed deck,

b. a plurality of body members each having a first portion overlying said feed deck and extending parallel thereto and a second portion extending laterally outwardly from said first portion and overlying said support members,

c. registration guide means mounted on said first portion of



each of said body members for guiding said insert material into registration with other insert material on said feed deck, said guide means having a generally upright and L-shaped configuration defining a closed unitary corner along which the lateral edge of said insert material moves, and

d. means for slidably clamping said second portion of each of said body members to the support member underlying said second portion of each of said body members in a desired lateral position with respect to said feed deck to force each of said guide means into intimate contact with said feed deck whereby said guide means forms a continuous horizontal support for said insert material to prevent said lateral edges of said insert material from being caught between the upper surface of said feed deck and said registration guide.

4,637,603

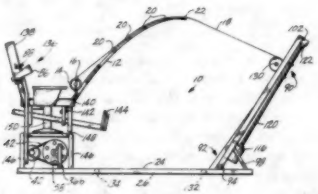
FISHING SIMULATOR

John A. Fry, 331 Deodar La., Bradbury, Calif. 91010, and Douglas B. Robinson, 1900 N. Altadena Dr., Pasadena, Calif. 91107

Filed Nov. 27, 1984, Ser. No. 675,355

Int. Cl.[4] A63B *21/24;* A63G *31/02*

U.S. Cl. 272—1 R **12 Claims**



1. A device for simulating a fish on a fishing line connected to a rod and reel comprising:

a frame;

a shaft journalled to the frame;

a drum affixed to the shaft;

means for attaching a fishing line from the rod and reel to the drum;

a sprocket supported for rotation about the shaft;

means for rotating the sprocket, a rotor affixed to the shaft, and a clutch adapted to frictionally couple the sprocket and rotor for imparting a torque to the shaft and drum; to tension the line and simulate the pull of a moving fish; and

means for simulating the position of a fish including line receiving means disposed on the frame remote from the rod and reel, the fishing line from the rod and reel passed by the receiving means back to the drum.

4,637,604

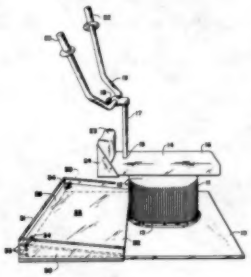
PHYSICAL THERAPY DEVICE

Blanche A. Burt DuPont, 8220 Hidden Lake Dr. S., Jacksonville, Fla. 32216

Filed Aug. 27, 1984, Ser. No. 644,692

Int. Cl.[4] A63B *21/00, 23/04*

U.S. Cl. 272—73 **23 Claims**



1. A therapy device for exercise comprising a solid planar floor base, and elongated vertical member having an upper end and a lower end, said lower end being rigidly affixed to said base, an elongated horizontal straddle seat member having a central portion between its forward and rearward ends with said central portion being rigidly affixed to said upper end of said vertical member substantially medially of the side edges of said seat member and substantially medially of said forward and rearward ends, a substantially vertical post rigidly affixed to and projecting upwardly from said forward end of said seat, upwardly extending ledge means supported by said seat member adjacent said vertical post for protecting the legs of a user from engagement with said vertical post during sitting and exercising on said device, and an elongated handle bar member adjustably mounted generally laterally of said post, adjustable means mounted on said post for attachment to said handle bar member generally medially between the free end portions thereof, said free end portions of said handle bar member being positioned angularly with respect to each other for the user of said device.

4,637,605

CONTROLS FOR A GAME BIKE

Frank Ritchie, 54 Prince Charles Drive, Georgetown, Ontario, Canada (L7G 3V1)

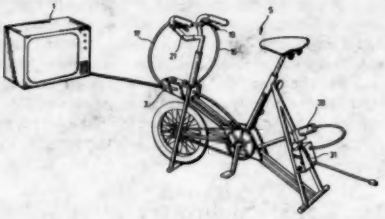
Filed Feb. 17, 1984, Ser. No. 581,362

Int. Cl.[4] A63B *69/16*

U.S. Cl. 272—73 **8 Claims**

1. A video game control arrangement comprising manually operated controls for controlling player movement on a video screen and mounting means for mounting said controls in a supported position on hand and arm rest suppoting means of an exercise device for manual operation of said controls with such manual operation being guided by the supporting means of the

exercise device, said manually operated controls comprising hand grip members operating cables for controlling a potentiometer control for controlling player movement on the video screen.

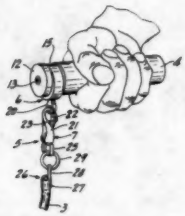


4,637,606

JUMP ROPE

Kevin W. Hunn, 2890 S. Wentworth Ave., Milwaukee, Wis. 53207

Filed Aug. 17, 1984, Ser. No. 642,034
Int. Cl.[4] A63B 5/20
U.S. Cl. 272—75 3 Claims



1. A jump rope unit, comprising a rigid handle adapted to be attached to the end of a flexible rope, said handle having a hand gripping portion, a rope connecting bearing unit secured to the rope end of said handle, said bearing unit including an axially extending plastic shaft integral with said hand gripping portion and projecting from an annular planar plastic end face on said hand gripping portion, an outer end wall secured to said shaft in outwardly spaced relation to said end face, said outer end wall having an inner plastic bearing face parallel to said annular planar plastic end face and with said shaft defining an annular race having a U-shaped cross-section, a bearing ring journaled on said shaft and having an outside diameter substantially equal to the diameter of said end face and having an inner opening slightly larger than said shaft and an axial length slightly less than the spacing of said outer end wall from said end face, said bearing ring having plastic surfaces engaging said shaft and said outer end wall and said end face to establish low friction bearing surfaces, and a rope-securing means secured to said ring for securement to a rope.

4,637,607

DRIVE UNIT FOR EXERCISING APPARATUS

James McArthur, 1760 Kingsway, Port Coquitlam, British Columbia, Canada (V3C 1S5)

Filed Feb. 15, 1985, Ser. No. 701,929
Int. Cl.[4] A63B 21/22
U.S. Cl. 272—132 9 Claims

1. A drive unit for an exercising apparatus, having a frame, comprising:

(a) a sub-frame;

(b) a driving sheave wheel, rotatably mounted on said sub-frame;

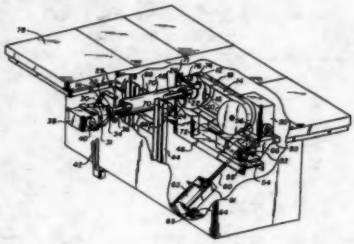
(c) a driven sheave wheel, rotatably mounted on said sub-frame;

(d) motor means coupled to said driving sheave wheel for rotatably driving same;

(e) an endless frictional belt linking said driving and driven sheave wheels and slipping with respect to one of the latter during rotation of said driving sheave wheel;

(f) a slide way bar affixed to said sub-frame;

(g) a mounting block slidably coupled to said slide way bar



for supporting said driving element and movable in a direction for adjusting friction force between said driving and driven elements;

(h) motor means affixed to said sub-frame and coupled to said mounting block and operable to reversibly move said block over said slide way bar;

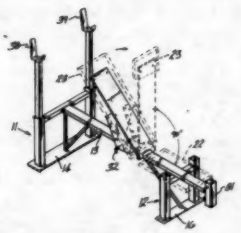
(i) stop means mounted on said sub-frame for blocking said driven element from movement beyond a start position, whereby said driving element is continuously driven by said motor means through an exercise.

4,637,608

COMPACT MULTIPLE PURPOSE EXERCISE BENCH

Brian T. Owens, Meriden, and Fredrick W. Corona, Hamden, both of Conn., assignors to Wallingford Barbell Company, Wallingford, Conn.

Filed May 15, 1984, Ser. No. 610,325
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—134 1 Claim



1. An adjustable exercise bench defining a hinged, normally flat body support in the form of a truss comprising

a pair of spaced tubular frames spanned and supported by a central beam, said frames being fixed individually to floor plates, a single diagonal support element individual to each frame and connecting the floor plate of each frame to the central beam to provide rigidity to the truss, a first section of said body support being fixed to the truss, a second section of said body support being hinged to the truss, both sections of said body support overhanging and projecting beyond the truss, a pair of spaced brackets fixed to the second section straddling said beam, indexing means on said brackets cooperating with said central beam for positioning said second section of said body support

releasably in a plurality of angular positions relative to said first section of said body support, said indexing means including an array of pairs of registered apertures on said brackets, each pair of apertures being operable to receive and support a pin bearing directly on said central beam,

a first of said tubular frames defining a pair of spaced wells or sockets operable to receive removably mating support members in telescoping fashion, each said support member having a horn or cradle for receiving and supporting a barbell, clamp means on each said socket cooperating with its mating support member for adjusting the height of a support member and thus its cradle relative to the body support,

the other of said tubular frames defining a second pair of spaced sockets, a second body support having legs received telescopically and removably in said second pair of sockets, adjustment means on one of said legs and said second pair of sockets for changing the position of said second body support relative to said normally flat body support, a fifth socket fixed to one end of the bench and being disposed in a medial position, said socket being formed with a through bore and having clamp means,

a leg supporting a leg bracket member is received telescopically in the through bore of said fifth socket, said bracket member being adjustable vertically by said clamp means, said bracket member having a pair of spaced flanges defining a bearing, an L-shaped angle frame supported pivotally by said bearing, said angle frame terminating at each end in a pair of opposed, outwardly projecting stub shafts, and one end of said angle frame having a fifth stub shaft projecting at right angles to an adjacent pair of opposed stub shafts, said second body support and said bracket member being adjustable relative to one another to accommodate the physique of an individual.

4,637,609

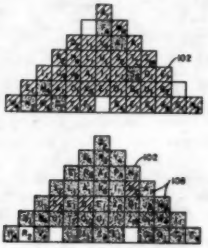
METHOD FOR A GAME

John R. Vanderhoof, 200 E. 36th St., New York, N.Y. 10016

Division of Ser. No. 652,223, Sep. 18, 1984, Pat. No. 4,591,161, which is a continuation of Ser. No. 404,410, Aug. 2, 1982, abandoned. This application Mar. 18, 1986, Ser. No. 840,665

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—272 **31 Claims**



1. A method of playing a game for a plurality of competitors, using an apparatus having means defining a plurality of playing spaces in a grid shaped pattern and means defining a plurality of distinguishable sets of alphanumeric character-representing elements, each element dimensioned for placement within one of said playing spaces, so as to be useful for forming words within said grid shaped pattern, said method comprising:

assigning one of said distinguishable sets of elements to each competitor for manipulation into words in achieving a level of accomplishment characterized by a score;

executing a sequence of playing phases in which said competitors take turns at building words in said grid shaped pattern and then expanding said words into new words,

said sequence of playing phases followed by a terminating scoring phase comprising determining a value for each scorable word depending on its structure, and determining each competitor's score by combining the values of only those scorable words which end in one of his elements and were not further expanded;

said scorable words comprising all words which are used in determining any competitor's score.

4,637,610

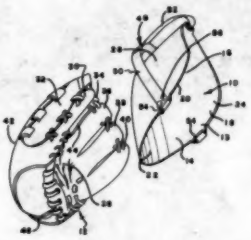
BASEBALL GLOVE HOLDER AND TRAINING AID

Damon L. Carr, 860 Washoe La., Susanville, Calif. 96130

Filed Feb. 5, 1985, Ser. No. 698,383

Int. Cl.[4] A63B *71/02*

U.S. Cl. 273—26 C **9 Claims**



1. A glove retainer in combination with a baseball glove having a central ball pocket and webbing which comprises:

a. a scoop formed of a stiff, shape-retaining sheet material and having a three-sided corner pocket with a rear face having a convex contour conforming to the front surface contour of said baseball glove;

b. glove retaining means carried on the backside of the scoop and including restraining means extending across the rear surface of said baseball glove when the latter is received over the convex surface of said scoop and thereby securing said glove in assembly to said glove retainer with the rear face of said scoop received in the central ball pocket of said glove.

4,637,611

SLOT MACHINE WITH REEL POSITION DETECTOR

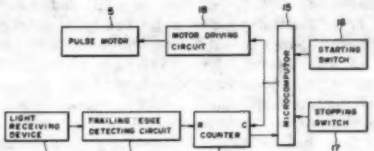
Norihiko Hamada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Oyama, Japan

Filed Jan. 11, 1982, Ser. No. 338,497

Claims priority, application Japan, Jan. 12, 1981, 56-1762[U]; Apr. 27, 1981, 56-59868[U]

Int. Cl.[4] A63F *5/04*

U.S. Cl. 273—143 R **3 Claims**



1. A slot machine having a plurality of reels each of which has an annular series of symbols on the peripheral surface thereof at regular intervals, comprising:

pulse motors one individual to each said reel for driving the associated said reels;

means for generating and emitting a series of pulse signals,

motor driving means receiving said pulse signals and causing

said pulse motors to rotate by one step for every received pulse signal;

means for detecting a predetermined point on each said reel once every revolution thereof; and

means to count said pulse signals and to reset to zero its previous contents by a signal from said predetermined point detecting means for detecting the stopped positions of said reels according to the number of said counted pulse signals.

4,637,612

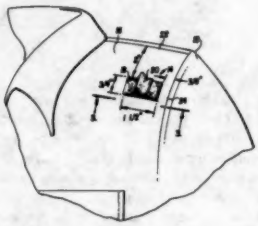
GOLF CLUB SWING TRAINING AID

Judd Wilkins, 281 Littletown Quarter, Williamsburg, Va. 23185

Filed Jul. 25, 1985, Ser. No. 758,946

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—183 B **3 Claims**



1. A sport club-swing marker assembly comprising:

a shirt-type garment having a neck opening and arm openings to be worn on the upper body of a sportsman who will swing a club;

a flat base member having a first side thereof affixed to a front shoulder area of said shirt-type garment, said flat base member covering a relatively large area of said shirt-type garment and comprising, on a second side thereof, facing away from said shirt-type garment, a first fastening means of a fastening pair, said first fastening means being located substantially throughout said relatively large area;

a marker member for repetitive-releasable, attachment to said base member, said marker member being substantially smaller than said flat base member and having a shirt side and an indicator side, said shirt side of said marker member including a second releasable fastening means of said fastening pair for repetitively engaging and disengaging said first fastening means and, when engaged therewith, for remaining engaged thereto until a substantial amount of force is used to pull these two members apart, and said marker side of said marker member including a marker element for contacting a small facial area of said sportsman at some point during a swing of a club and providing a distinctive sensation to said small facial area for indicating to the sportsman that such contact has been made so as to inform said sportsman that a correct swing position has been achieved;

whereby said sportsman can relatively easily move said marker member to various locations on said front shoulder area of said shirt-type garment on said base member to achieve a desired contact between said marker member and said sportsman's face during a club swing by said sportsman.

4,637,613

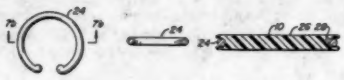
MOLDED MAGNETIC BINGO CHIP

Kevin Bishop, Livermore, Calif., assignor to Bingo Experience/ARC, Livermore, Calif.

Filed Oct. 25, 1983, Ser. No. 545,367

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—239 **2 Claims**



1. A marker for playing bingo comprising

a disk of transparent material having a predetermined axial thickness and having a peripheral edge, the disk having a concentrically located slot in its peripheral edge; and

a split ring of magnetic material positioned within said slot and being concentric with the disk, the split ring having an axial thickness which is less than the predetermined axial thickness of the disk, and wherein the split ring has first and second ends which are turned inwardly to provide a biasing force against the disk.

4,637,614

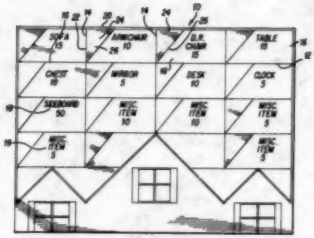
COLLECTOR'S AUCTION GAME

Linda M. Gibbon, and Randolph H. Gibbon, both of 14030 Harrisville Rd., Mt. Airy, Md. 21771

Filed Oct. 18, 1985, Ser. No. 788,967

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—271 **4 Claims**



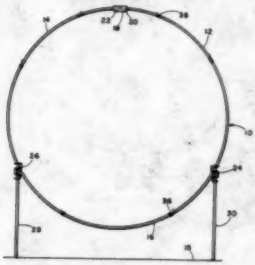
1. An auction game apparatus providing for competitive bidding between players comprising in combination: a game board for each player, said game board representing a house and having a plurality of pockets thereon for receiving and storing auction-item cards, certain pockets of the game board bearing the names of specific collectable items which must be bought and inserted therein to furnish the house, other pockets for receiving miscellaneous auction-item cards required to fill the game board, all pockets of the game board bearing point values for the auction-item cards inserted therein; a group of auction-item cards each having a description of an item which may be used to furnish the house, said group of cards containing cards indicating a designated collectable item of furniture, a collection to which the item belongs, the history of the item, and its appraised value and each of said collectable item cards corresponding to one of the designated collectable item playing board pockets and said group of auction-item cards containing a number of other cards representing other items which may or may not belong to a collection which may be used to fill pockets on the game board not having a collectable item name, a second deck of cards containing only the names of the specific collections, simulated money for distribution to and use by the players to bid on and acquire auction-item cards, and bonus means for rewarding players for skill in bidding for and acquiring items required to fill the game board.

4,637,615

HOLDER FOR SHOTGUN PATTERN PAPER

Howard R. Foreman, Rte. 1, Box 110A, Miami, Okla. 74354

Filed Jul. 26, 1985, Ser. No. 759,332
Int. Cl.[4] F41J 1/10
U.S. Cl. 273—407 10 Claims



1. A holder for shotgun pattern paper comprising:

a ring of two upper loops and one lower loop in the form of archs each upper loop having an upper end and a lower end and the lower loop having a hook at each end;

a top clamp for holding the upper ends of said two upper loops together;

leg means for supporting the holder above a surface;

two bottom clamps for receiving the lower ends of said two upper loops and the hooks on said lower loop and further holes for receiving said leg means.

5. A clamp made from a rectangular piece of material having dimensions X and Y and being folded by six right angles to form two U-shaped sections connected by a planear section, said first U-shaped section having a Leg A, and Leg B and the second U-shaped section having a Leg C and Leg D and in which B is greater in width than said Legs A, C and D, a first hole through said Section A, a second hole through said Section B, said holes aligned to receive one end of an arch shaped rod;

third and fourth holes through said Sections C and D respectively in the center thereof;

fifth and sixth holes through section C on either side of said third hole and seventh and eighth holes on either side of said fourth hole, said seventh and eighth holes being farther from said fourth hole than said holes five and six are from said third hole.

8. A holder for shotgun pattern paper comprising:

a rectangular frame including an upper bar, a first side bar and a second side bar, a bottom section with a hook member at each end thereof;

a first and a second clamping means to clamp said top section to said side section respectively;

leg means for supporting the holder above a surface;

two bottom clamps for receiving the lower end of said two side bars and the hooks on said bottom bar and having holes for receiving said leg means.

4,637,616

MARKING PROJECTILE

Carolyn C. Whiting, 331 Trudelle Street, Unit 78, Scarborough, Ontario M1J 3J9, Canada

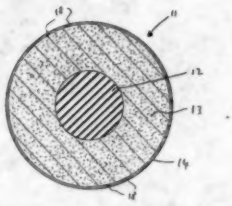
Filed Oct. 10, 1985, Ser. No. 786,069
Int. Cl.[4] A63B 37/00, 67/00, 71/02
U.S. Cl. 273—418 9 Claims

1. A projectile to be thrown by hand to mark its point of impact comprising:

(a) a central core of resiliently deformable material having its density approximately that of rubber and providing substantial mass to the projectile to permit it to be readily thrown by hand;

(b) a porous surrounding cushioning layer of a compressible material relatively less dense than said core;

(c) a marking material in powdered form impregnating the surrounding layer, and



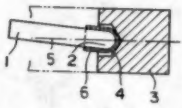
(d) a perforated flexible cover enclosing the surrounding layer, the cover having a plurality of perforations on all sides of the projectile so that, upon impact with a surface, a small quantity of powdered marking material will be ejected through said perforations to mark the point of impact.

4,637,617

DEVICE FOR FORCING PISTON RING RADIALLY OUTWARDLY

Minoru Kawane, Ishikawa, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 9, 1986, Ser. No. 849,953
Claims priority, application Japan, Apr. 15, 1985, 60-54729[U]; Apr. 15, 1985, 60-54730[U]
Int. Cl.[4] F16J 9/06
U.S. Cl. 277—150 4 Claims



1. A device for forcing a piston ring radially outwardly wherein a spring and a plunger are accomodated in each hole on a piston so that reaction force of the spring forces the plunger to press the piston ring against a bore wall of a cylinder, comprising said plunger in the form of a single rod and having a convex and semispherical head, and said piston ring having a substantially conical hole for receving said head.

4,637,618

COMPOSITE GASKET AND FITTING INCLUDING SAME

Jose E. Valls, Ponce, P.R., assignor to Vassallo Research & Development Corporation, Ponce, P.R.

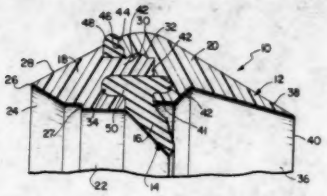
Filed Jul. 13, 1984, Ser. No. 630,527
Int. Cl.[4] F16J 15/10; F16L 19/07
U.S. Cl. 277—152 29 Claims

1. A composite gasket for forming a seal between a pipe bell and a spigot, comprising:

a major portion of non-elastomeric plastic material; and

a minor portion of elastomeric material, said minor portion being axially encased by said major portion and having a

first sealing lip extending from said major portion in a radial direction, said major portion including first and



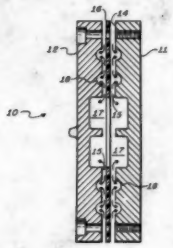
second segments entrapping said minor portion therebetween, said segments having interlocking sections.

4,637,619

CONCENTRIC SEAL RINGS

Warren W. Stansberry, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 19, 1985, Ser. No. 811,065
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—167.5 **1 Claim**



1. An apparatus providing a seal between two halves of a fluid chamber comprising:

a fluid housing formed from two halves each having a static sealing face, said housing have an internal cavity when said static sealing faces are held together by a compressive force,

a plurality of raised concentric rings disposed on each of said static sealing face,

spaces between said rings forming recesses,

means for annularly aligning said rings and annularly aligning said recesses on a common axis,

a planar gasket material extended across and disposed between said sealing faces, said material having a predetermined density when unconstrained, and having the property of deformation with time when subject to compressive forces, and

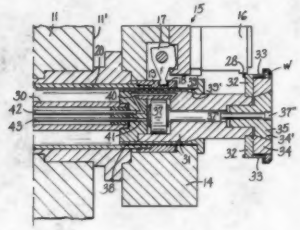
means for applying said compressive force to said gasket material so that portions of said material are forced into said recesses, whereby said predetermined density increases within said recesses as said gasket deforms with time.

4,637,620

TWO STAGE CHUCK

Merton J. Graham, 253 Fairground Rd., North Springfield, Vt. 05150, and Paul H. Miller, 61 Daffodil La., Meriden, Conn. 06450

Filed Sep. 4, 1984, Ser. No. 646,804
Int. Cl.[4] B23B *31/00*
U.S. Cl. 279—1 DA **5 Claims**



1. A chuck assembly adapted to be mounted for rotation and axial movement in relation to the headstock of a lathe, comprising:

a chuck having a body and a plurality of radially movable jaws adapted in a first machining position of the chuck to grip the periphery of an annular work-piece;

a work-piece locating means associated with each jaw;

an axially movable jaw actuating means;

a first hydraulic means adapted to move said actuating means to and from work-piece gripping position;

an expansible mandrel adapted for movement from a retracted first position to an advanced intermediate position in the bore of the annular work-piece;

an axially movable support for said mandrel;

a second hydraulic means for moving the mandrel from said first position to said intermediate position;

a third hydraulic actuated means for expanding said mandrel in said bore to engage the work-piece;

means causing said first hydraulic means to move the jaws to work-piece releasing position;

means causing said second hydraulic means to move the mandrel and work-piece from the intermediate position to a second machining position of the chuck, and

means causing said third hydraulic means to release the work-piece.

4,637,621

ACTIVE SHOCK ABSORBING SYSTEM FOR A VEHICLE

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

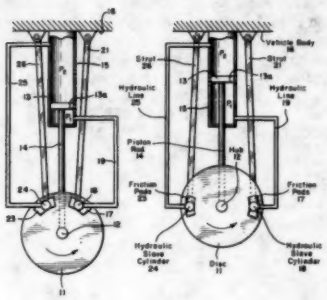
Filed Jul. 1, 1985, Ser. No. 750,201
Int. Cl.[4] B60S *9/00*
U.S. Cl. 200—6 R **8 Claims**

1. An active shock absorbing system for maintaining a horizontally moving vehicle body stable at a constant vertical level despite the presence of disturbing forces that effect vertical movements of the rotating wheels on which the body is supported, said system comprising for each of the wheels:

sensing means for sensing a change in vertical displacement, between the vehicle body and the wheel, produced by a disturbing force on the vehicle body;

and stabilizing means, controlled by said sensing means, for

utilizing the kinetic energy of the rotating wheel to exert a counter force on the body in the direction opposite to



the disturbing force in order to counterbalance the disturbing force and hold the body at a fixed vertical level.

4,637,622

CHILD SAFETY STRAP

Francis A. Burgard, 12800 W. Cleveland Ave., New Berlin, Wis. 53151

Filed Nov. 2, 1984, Ser. No. 667,620
Int. Cl.[4] A47D *1/10*
U.S. Cl. 280—33.99 B **4 Claims**

1. A safety strap for children, comprising

a safety buckle having a closed loop at one side and at its other side a serpentine connector permitting adjustment of a stap connected thereto,

a strap having one end through said loop and connected back on itself to fix said one end to said one side of said buckle,

the other end of said strap being led into and through said serpentine connector to adjustably connect said strap to said other side of said buckle with said other end of the strap extending out of the serpentine connector,

and means fixed on said other end preventing pulling said other end back through and out of said serpentine connector, said means having no connection to said strap between said connector and said loop.

4,637,623

TOWING APPARATUS

Leslie Bubik, Ontario, Canada, assignor to Vulcan Equipment Company, Ltd., Scarborough, Canada

Filed Jul. 8, 1985, Ser. No. 752,980
Int. Cl.[4] B60P *3/12*
U.S. Cl. 280—402 **14 Claims**

8. An apparatus for use in lifting and towing a vehicle, comprising:

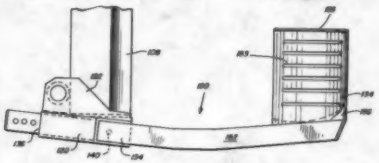
a support beam;

two wheel support members, each having an elongated arm and a wheel retainer;

means for mounting said wheel support members to opposing end portions of said support beam such that said arms are in a generally horizontal orientation and for rotating said wheel support members generally horizontally from a laterally remote position spaced outwardly from the sides of the vehicle to a vehicle lifting position immediately adjacent to the outer sides of a pair of wheels on said vehicle; and

means for permitting vertical movement of said wheel support members to facilitate location of said wheel support members in said vehicle lifting position.

14. An apparatus for use in lifting and towing a vehicle, comprising:



a support beam positionable below the vehicle and having end portions which extend outside an opposed pair of wheels on said vehicle;

two wheel support members, each including an arm and a wheel retainer;

two collars, each pivotally connected to one of the end portions of said beam and adapted to receive one of the arms of said wheel support members to thereby mount said wheel support members to said beam and permit rotation of said wheel support members;

each of said collars including a passage increasing in vertical dimension from front to back to permit vertical movement of said wheel support members; and

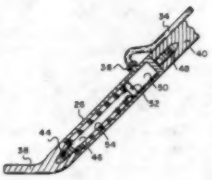
means for locking said wheel support members within said collars.

4,637,624

HYDRAULIC RIGHTING MOTORCYCLE KICKSTAND

Don Shur, P.O. Box 728, Cologne, N.J. 08213

Filed Feb. 28, 1986, Ser. No. 835,098
Int. Cl.[4] B62H *1/02*
U.S. Cl. 280—298 **8 Claims**



1. A righting device used in combination with a kickstand device used to support a motorcycle on the ground at a tilted angle wherein the kickstand device is pivotally connected to the motorcycle proximate to the center of a lower frame of the cycle, comprising:

(a) a fluid actuated cylinder structurally connected as an intermediate section of the kickstand between an upper kickstand connection pivotally connected to the motorcycle frame and a lower foot section of the kickstand to rest on the ground,

(b) a piston rod in the cylinder extendable downwardly and structurally connected to the foot section, and

(c) fluid pressure means to supply fluid pressure to the cylin-

der to force the piston rod downwardly with the foot section against the ground to right the motorcycle.

4,637,625

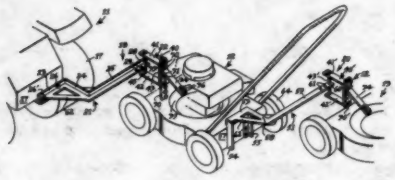
MOWER HITCH ASSEMBLY

John B. Blackwell, 1507 Woodland Dr., Centerville, Tenn. 37033

Filed Jun. 20, 1985, Ser. No. 746,745

Int. Cl.[4] B60D *1/14;* A01D *75/30*

U.S. Cl. 280—411 C 4 Claims



1. In a lawn mower towing assembly including a leading vehicle and a trailing vehicle, each vehicle having a longitudinal front-to-rear axis, a hitch assembly comprising:

(a) a leading hitch device comprising leading bracket means for connection to the rear portion of a leading vehicle, and an elongated draw bar extending transversely from said bracket means, laterally of the longitudinal axis of the leading vehicle, and terminating in a free end portion,

(b) means securing said leading bracket means to the rear portion of the leading vehicle,

(c) a trailing hitch device comprising a trailing bracket bar for connection to the front portion of a trailing vehicle, and a single clevis member,

(d) means securing said trailing bracket bar to the front portion of the trailing vehicle in operative position,

(e) said single clevis member comprising vertically spaced upper and lower arms and a bight member connecting said upper and lower arms,

(f) means securing said bight member to said trailing bracket bar so that said upper and lower arms project forwardly in a substantially vertical plane,

(g) said draw bar having a vertical journal hole extending through its free end portion,

(h) said upper and lower arms terminating in free end portions including vertically aligned holes,

(i) a pintle removably inserted substantially vertically through the holes in said upper and lower arms and said vertical journal hole when said free end portion is between said upper and lower arms and said vertical journal hole is in registry with said pintle, in operative position,

(j) said journal hole being large enough to permit free pivotal movement of said draw bar about the vertical axis of said pintle,

(k) said free end portion of said draw bar having a vertical dimension, the vertical spacing between said upper and lower arms being substantially greater than the vertical dimension of said free end portion of said draw bar to permit a limited amount of vertical independent motion between the leading and trailing vehicles connected by said hitch assembly.

4,637,626

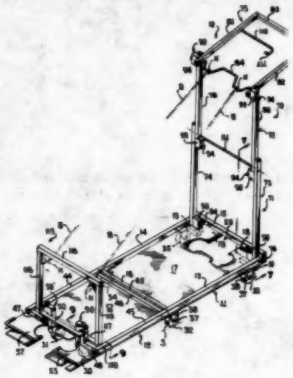
PORTABLE, FOLDABLE AND CONVERTIBLE LUGGAGE TROLLEY

Janet M. P. Foss, Naish Hillhouse, Reybridge, Lacock, England; John Foss, Lacock; C. G. Brooks, Wilts, both of United Kingdom, and Myron H. Ridgely, Waynesboro, Pa., assignors to Janet Mary Penrose Foss, England

Continuation-in-part of Ser. No. 449,824, Dec. 14, 1983. This application Nov. 1, 1984, Ser. No. 667,331

Int. Cl.[4] B67B *3/02*

U.S. Cl. 280—655 31 Claims



1. A portable and foldable luggage trolley comprising a base support adapted to be disposed in a generally horizontal plane for supporting luggage thereupon, a handle, first means for pivoting said handle to said base support for pivoting movement between a first position in generally upright relationship to said base support and a second position in generally adjacent relationship to said base support, means for releasably latching said handle relative to said base support in said first postition, second means for pivoting said latching means to said base support for pivoting movement between a first latched position latching said handle relative to said base support in said first handle position and a second unlatched position permitting relative pivoting movement of said handle between the first and second positions thereof, means responsive to pivotal movement of said handle from said second to said first handle position for pivoting said latching means to said first latched position, said releasable latching means being disposed adjacent said first pivoting means, and said second pivoting means being disposed in a generally horizontal plane.

4,637,627

VEHICLE SPRING SUSPENSION ARRANGEMENT

Richard H. Stone, Watford, England, assignor to Leyland Vehicles Limited, Leyland, England

Filed Feb. 16, 1984, Ser. No. 580,896

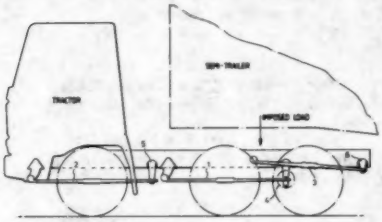
Claims priority, application United Kingdom, Feb. 17, 1983, 8304402

Int. Cl.[4] B60G *5/00*

U.S. Cl. 280—686 12 Claims

1. A wheeled vehicle having a chassis supported by at least two primary axles and one secondary axle, and an elongate suspension member arranged lengthwise of the vehicle at right-angles to the secondary axle, to which it is coupled, one end of the suspension member being coupled to the chassis and restrained from relative vertical movement, characterized in that a section of the suspension member remote from the said end, and an associated portion of the chassis, are adapted so that the said section engages that portion of the chassis, and the suspension member thereby resiliently supports the chassis on

the secondary axle, only when a load imposed on the chassis exceeds a predetermined threshold, the suspension member dropping out of supportive engagement with the chassis and permitting all vehicle wheels to remain in ground contact when the imposed load is below the threshold, wherein the suspension member is a leaf spring coupled at its middle region to the secondary axle, the said section of the suspension member is the other, free, end of the leaf spring which engages an



adapted portion of the chassis with imposed loads over the threshold and the leaf spring is mounted on the chassis at the free end by a slipper bracket having an upper portion for engaging the leaf spring when under load, and a lower portion for supporting the leaft spring when it has dropped out of engagement, the upper and lower portions being separated by a controlled vertical air gap wider than the thickness of the free end of the leaf spring.

4,637,628

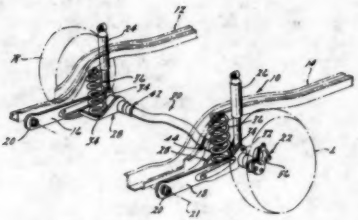
ANTI-ROLL TORSION BAR ARRANGEMENT FOR VEHICLE REAR SUSPENSION

David J. Perkins, Royal Oak, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 2, 1985, Ser. No. 803,445

Int. Cl.[4] B60G *19/00, 21/00*

U.S. Cl. 280—689 **3 Claims**



1. A rear axle suspension apparatus for the rear wheels of a motor vehicle, the suspension apparatus comprising:

a pair of rearward extending control arms;

means for mounting the forward end of each said control arm to the chassis of said vehicle for pivotal movement about an axis transverse to the longitudinal axis of said vehicle;

a rear axle cross-beam assembly secured at the rearward ends of said control arms, said rear axle cross-beam assembly comprising;

a cylindrical sectioned tubular member extending transversely such that its outboard end portions are each located adjacent to one of said wheels; a pair of first and second outer cylindrical sleeves, said first sleeve concentrically surrounding one outboard end portion of said tubular member so as to be fixedly secured thereto, said second sleeve concentrically surrounding the other outboard end portion of said tubular member so as to be supported by journal means for limited rotation relative to said inner tubular member; each said first and second sleeve being fixedly connected to the rearward end of an associated one of said control arms;

a pair of mirror image first and second castings, each said casting having a inboard collar portion and an outboard wheel support portion; each said casting wheel support portion supporting an associated rear wheel mounting means thereon such that said casting wheel support has its transverse rotational axis offset from the transverse principal axis of said inboard collar portion; each said collar portion defining a transversely aligned bore fixedly receiving therein the outboard end of its associated first and second sleeve;

a single transversely extending anti-roll torsion bar having a predetermined axial dimension of about one fourth the overall axial dimension of said rear axle cross-beam assembly, said anti-roll torsion bar extending axially in a substantially co-extensive manner within said second sleeve and in concentrically spaced relation within said tubular member other outboard end portion;

an annular bushing fixedly received within said tubular member, said torsion bar having an enlarged inboard and outboard head portion at each end thereof whereby said head portions are formed with identical polygonal cross-sections, said outboard head portion having an attachment end plate fixed thereon disposed normal to the principal axis of said torsion bar, said annular bushing having a polygonal cross-section transversely extending bore provided therein shaped complementary to said torsion bar inboard head portion for slidable reception therein;

said second casting inboard collar portion having a polygonal cross-section transversely extending bore therein shaped complementary to said torsion bar outboard head portion for slidable reception therein, said torsion bar head portions each defining a plurality of faces located in common transversely extending planes, said torsion bar inboard and outboard head portions being slidably received in their respective tubular member annular bushing bore and second casting inboard collar portion complementary shaped bore;

such that with said end plate secured by fastener means to said second casting and said inboard head portion secured within said annular bushing by a cross-pin, said torsion bar positively maintains a fixed transverse dimensional relationship between said first and second castings;

and whereby said tubular member being rotatable in a limited manner relative to said second sleeve by said journal means upon opposite pivotal movement between said control arms resulting in said anti-roll torsion bar being subjected to torsion resisting said control arms opposite pivotal movement so as to increase the roll stiffness of the rear axle suspension apparatus.

4,637,629

NON-ENCUMBERING TORSO RESTRAINT SYSTEM

Robert J. Cummings, Hermosa Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 1, 1985, Ser. No. 761,285

Int. Cl.[4] B64D *25/06;* **B60R** *21/10*

U.S. Cl. 280—801 **20 Claims**

13. An apparatus for protecting the torso of a crewmember from inertial forces while said crewmember is in a seat within a vehicle and which may be used in conjunction with a parachute harness, comprising:

a left support strap;

a left web member connected to said left support strap and forming a first loop therewith encircling the torso of the crewmember, said first loop capable of rotation relative to the seat, said left web member contacting the left lateral side of the torso of the crewmember;

a right support strap;

a right web member connected to said right support strap and forming a second loop therewith encircling the torso of the crewmember, said second loop capable of rotation

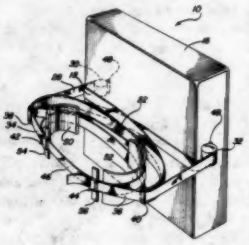
relative to the seat, said right web member contacting the right lateral side of the torso of the crewmember;

a right vertical strap connecting said right support strap to the torso of the crewmember for preventing said second loop from slipping down the crewmember's torso;

a left vertical strap connecting said left support strap to the torso of the crewmember for preventing said first loop from slipping down the crewmember's torso;

a right inertial reel having a right tension strap, said right reel detachably mounted on the seat at the rignt side thereof;

a left inertial reel having a left tension strap, said left reel detachably mounted on the seat at a left side thereof;



means for rotatably connecting said left tension strap to said first loop so that said first loop can rotate relative to said left inertial reel;

means for rotatably connecting said right tension strap to saio second loop so that said second loop can rotate relative to said right inertial reel;

a right lateral pad mounted at a right lateral front portion of the seat back, said right pad having a portion projecting forward of the seat back, said right tension strap passing over said portion projecting forward;

a left lateral pad mounted at a left lateral front portion of the seat back, said left pad having a portion projecting forward of the seat back, said left tension strap passing over said portion projecting forward.

4,637,630

WEBBING TENSION ADJUSTING APPARATUS

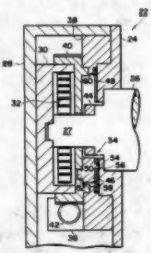
Yuji Nishimura, and Teruhiko Koide, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jun. 18, 1985, Ser. No. 745,948

Claims priority, application Japan, Jun. 21, 1984, 59-93104[U]

Int. Cl.[4] B60R *22/44*

U.S. Cl. 280—807 **20 Claims**



1. A webbing tension adjusting apparatus employed in a webbing retractor in which a takeup shaft for winding up an occupant restraining webbing is biased in the webbing wind-up direction by a resilient member, which comprises:

(a) driving means adapted to actuate said webbing takeup shaft when said means is rotated forwardly such that said takeup shaft is rotated in the webbing wind-off direction; and

(b) a one-way clutch adapted such that, when said driving means is rotated forwardly, said clutch connects said driving means and said webbing takeup shaft, while when said driving means is rotated backwardly, said clutch cancels the connection therebetween,

whereby it is possible to reduce the tension of said webbing when the occupant leaves the vehicle.

4,637,631

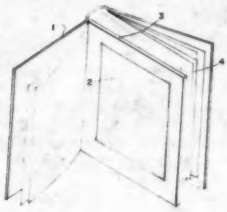
COMBINED BOOK AND MIRROR

Robert J. Baer, Honolulu, Hi., assignor to RJB and C Company, Honolulu, Hi.

Filed Oct. 23, 1984, Ser. No. 664,021

Int. Cl.[4] B42D *5/00, 15/00*; B42F *3/00*

U.S. Cl. 281—15 R **10 Claims**



1. A book in combination with a mirror, comprising:

(a) a series of sections in laminar alignment, wherein each section is provided with a plurality of flat rectangular sheets in laminar alignment, wherein each sheet is provided with first and second lateral edges, whereby each section contains leaves bound together on one edge, and whereby said one edge is the bound edge, and wherein at least one section is laminated together by means for laminating, whereby a thick, flexible leaf is formed;

(b) a hole in said thick leaf extending partially therethrough;

(c) a mirror immovably placed in said hole by means for attaching;

(d) a cover for said series of sections in laminar alignment connected to said sections at points along said bound edges of said sections.

4,637,632

HOLDING DEVICE

Arlyn R. Rubash, 2908 W. Brookside Dr., Peoria, Ill. 61615, and Duane R. Rubash, 684 Garys Dr., Antioch, Ill. 60002

Filed Nov. 15, 1985, Ser. No. 798,442

Int. Cl.[4] B42D *17/00*; A47B *65/00*

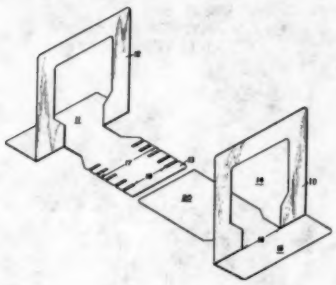
U.S. Cl. 281—45 **10 Claims**

1. A device for holding at least one object in a stable, fixed position, comprising:

a. a first holding member having a surface adapted to be placed into holding contact with said object and having an insert portion having a first width that is its largest width, said first holding member being structurally adapted to be inserted into and placed in locking relationship with a second holding member, said insert portion containing a locking area having a locking area width; and

b. a second holding member having a surface adapted to be placed into holding contact with said object and having an opening structured so as to contain a first distance that is greater than the first width of said insert portion and containing a second distance that is less than said first width but greater than the locking area width so as to enable said insert portion to be inserted into said opening

at said first distance and then to be repositioned following said insertion at said locking area width so as to engage said locking area of said first member with a perimeter



portion of said second member thereby creating a stable, fixed locking relationship between said first and second holding members.

4,637,633

LABEL IN THE FORM OF A SHEET AND ENVELOPE

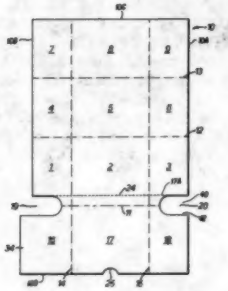
David J. Instance, Past Heap Farm, Pembury, Tunbridge Wells, Kent, England

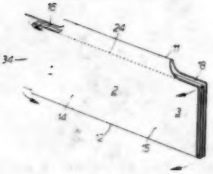
Continuation-in-part of Ser. No. 471,846, Mar. 3, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,687

Claims priority, application United Kingdom, Mar. 4, 1982, 8206331

Int. Cl.[4] B42D *15/00;* **B41L** *1/20;* **B26F** *3/02*

U.S. Cl. 283—81 **9 Claims**





1. A label in the form of an integral sheet/envelope for attachment to a product, said label comprising a sheet portion such as a sheet of printed instructions, and an envelope portion for removably carrying said sheet portion, said sheet portion and envelope portion being both formed from a common single folded sheet, said sheet comprising opposing side edges interconnected by opposing end edges, said sheet being divided into said least first and second parallel rows of three rectilinear panels each, the panels of said first row forming one of said end edges and being separated from the corresponding panels of said second row by a line of perforations, which extends transversely relative to said side edges of said sheet, said first row of three panels including two outer panels which each have a portion thereof cut away inwardly from respective side edges adjacent said line of perforations so that said line of perforations stops short of said side edges, said second row of panels together with a part of the center panels of the first row being folded so as to lie adjacent corresponding panels of said first row, said two outer panels of said first and second rows being folded behind the remaining center panels such that said first row of panels defines said envelope portion which contains said sheet portion defined by said second row of panels, both cut away portions being dimensioned so that when the envelope portion is folded both cut away portions expose a rearwardly facing region of said part of the center panel of the first row, the rear of said envelope portion being formed from the outer panels of the first row and said region, a front face of said center panel of said first row forming an exposed front of said envelope portion, said envelope portion remaining open along said one end edge which remains uncovered so that when the rear of the envelope portion, including said exposed region thereof, is attached to a surface, said sheet portion is removable from said envelope portion through said one end edge, while said envelope portion remains folded, by tearing said sheet portion along said line of perforations as said exposed region remains attached to the surface.

4,637,634

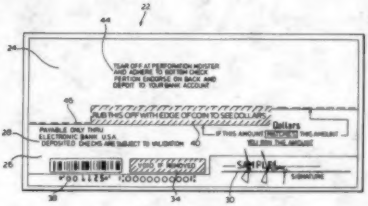
TWO-PART BANK DRAFT

Seymour L. Troy, and Kenneth E. Mullenix, both of P.O. Box 5027, Ft. Lauderdale, Fla. 33310

Filed Jul. 24, 1985, Ser. No. 758,477

Int. Cl.[4] B42D *15/00;* **G06G** *7/14*

U.S. Cl. 283—98 **21 Claims**



1. A sales promotional check in the form of a bankable draft for direct cashing or deposit at a bank, the bank draft comprising:

a first preprinted sheet having at least a portion which conforms to a first part of a bankable bank draft and having indentifying information thereon;

a second preprinted sheet comprising a second part of a bankable bank draft, the second part of the bankable draft containing identifying information thereon, said identifying information corresponding to the indentifying information on the first part of the bankable draft the first and second sheets firmly affixed adjacent one another by an adhering means to comprise a sheet to form the bankable bank draft.

4,637,635

DOUBLE-BLIND LABELS

Richard A. Levine, 34 Lake Dr., North Brunswick, N.J. 08902

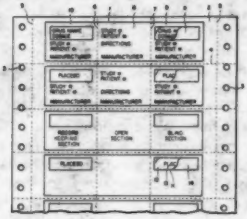
Filed Dec. 3, 1985, Ser. No. 804,044

Int. Cl.[4] B42D *15/00;* **G09F** *3/00*

U.S. Cl. 283—101 **3 Claims**

1. At least one pressure sensitive label comprising a backing

sheet having at least one removable, double blind self adhesive label affixed thereto, said label separable into at least two sections, said sections including a blind section comprising a blinded area having information printed thereon, a clear lac-



quer-like coating thereover and an opaque scratch-removable coating over said lacquer-like coating, an open section and a record keeping section which identifies the blinded information.

4,637,636

TUBE COUPLINGS

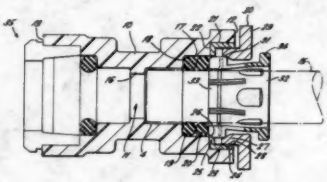
John D. Guest, "IONA", Cannon Hill Way, Bray, Maidenhead, Berkshire, United Kingdom

Filed Oct. 30, 1985, Ser. No. 793,004

Claims priority, application United Kingdom, Nov. 12, 1984, 8428532; Apr. 4, 1985, 8508943

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—38 **9 Claims**



1. A tube coupling comprising a hollow body having an opening to be coupled with a tube, a collet having an annular portion having a central axis and resilient arms extending from the annular portion into the hollow body, said resilient arms being deflectable radially with respect to said central axis, a cam member, and means mounting said cam member on the body, said cam member having an internal tapered cam surface reducing in a direction extending out of the body, said cam surface being engageable with the resilient arms of the collet to compress the arms radially inwardly into engagement with the tube in the collet to hold a tube in the body, said collet being axially movable in either direction with respect to the cam member to increase or decrease the radial clamping action of the cam surface on the resilient arms against a tube encircled by the arms, and means located within said hollow body for varying additionally the compressive force applied to the collet by the cam surface of the cam member, said means being operable to adjust the position of the cam member relative to the body in the direction of the collet axis and thereby adjust the radial compressive force applied by the resilient arms to a tube within the collet.

4,637,637

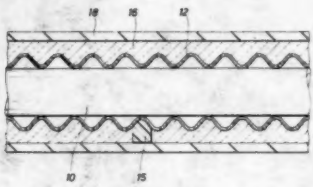
PIPELINE SYSTEM WITH ENCAPSULATED INSULATION

Alexander S. Aderjan, Pearland, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Dec. 11, 1984, Ser. No. 680,421

Int. Cl.[4] F16L *59/14*

U.S. Cl. 285—47 **7 Claims**



1. A section of a pipeline system, comprising:

a section of pipe;

a first vapor barrier surrounding said pipe section having a first surface facing said pipe section and a second surface opposite said first surface, said first surface having a corrugated construction;

insulation material having a first surface and a second surface, said insulation material concentrically spaced from said pipe section, the first surface of said insulation material encasing and adhering to the second surface of said vapor barrier; and

a second vapor barrier concentrically spaced from said pipe section, said vapor barrier encasing and adhering to the second surface of said insulation material.

4,637,638

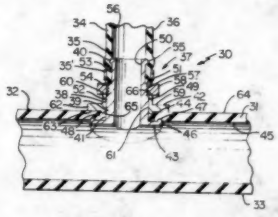
BRANCHED HOSE CONSTRUCTION, JOINT CONSTRUCTION AND PART THEREFOR, AND METHODS OF MAKING THE SAME

James B. Rush, Waynesville; James S. Bryan, Clyde; Jonas L. Gunter, Canton; Guy W. Dillard, Sylva; Roger D. Meadows, Waynesville, and Pearison W. Henry, Sylva, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 8, 1985, Ser. No. 709,962

Int. Cl.[4] F16L *41/00*

U.S. Cl. 285—158 **11 Claims**



1. In a branched hose construction comprising a first tubular member provided with opposed ends and with an opening therein intermediate said opposed ends thereof, a second tubular member provided with opposed ends, and a joint construction comprising a tubular insert provided with opposed ends joining one of said ends of said second tubular member to said opening by having one end of said tubular insert disposed through said opening and the other end thereof interconnected to said one end of said second tubular member whereby said tubular members are in fluid communication with each other through said tubular insert and said second tubular member branches outwardly from said first tubular member, said joint construction comprising a washer-like member telescoped on

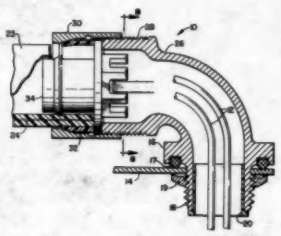
said tubular insert and cooperating with said one end of said tubular insert in mechanically clamping said first tubular member therebetween completely around said opening thereof, said joint construction further comprising securing means securing said washer-like member to said tubular insert in said clamping relation thereof, said one end of said tubular insert comprising an annular flange, said first tubular member having an internal surface means, said annular flange having a surface means facing and engaging said internal surface means of said first tubular member and being provided with an inner peripheral means and an outer peripheral means, said surface means of said annular flange having annular projection means thereon that digs into said internal surface means of said first tubular member around said opening thereof, said first tubular member having an external surface means, said washer-like member having a surface means facing and engaging said external surface means of said first tubular member and being provided with an inner peripheral means and an outer peripheral means, said surface means of said washer-like member having annular projection means thereon that digs into said external surface means of said first tubular member around said opening thereof, the improvement wherein said annular projection means of said annular flange comprises a single annular projection means that is disposed substantially at said outer peripheral means of its respective said surface means and wherein said annular projection means of said washer-like member comprises a single annular projection means that is disposed substantially at said inner peripheral means of its respective said surface means.

4,637,639

NON-METALLIC LIQUID-TIGHT CONDUIT ENGAGING CONNECTOR

Robert W. Jorgensen, Niles, Mich., and Michael R. Nowak, Mishawaka, Ind., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jul. 22, 1985, Ser. No. 757,728
Int. Cl.[4] F16L *33/23*
U.S. Cl. 285—249 **9 Claims**



1. A connector for forming a liquid-tight and mechanically strong connection with a non-metallic, flexible, liquid-tight electrical conduit comprising the combination of

a generally tubular metal body having a substantially flat end face and external threads adjacent said end face;

a plastic ferrule having a tubular portion and a radially outwardly protruding flange shaped and dimensioned to lie against said flat end face of said body,

said ferrule including a radially outwardly protruding rib axially spaced from said flange between said flange and one end of said tubular portion;

means on said body for engaging said ferrule to limit rotation of said ferrule relative to said body;

a plastic tubular sleeve having a maximum outer diameter corresponding to the diameter of said flange, a cylindrical inner surface, an axial length substantially equal to the axial spacing between said rib and said flange and having an inwardly tapering outer surface portion, said sleeve being positioned around said tubular portion of said ferrule with the smaller end of said tapering surface portion radially spaced from said rib to receive an end of said conduit, said sleeve having a plurality of generally triangular slots extending axially inwardly only from said smaller end; and

a metal compression nut having an internally threaded portion at one end dimensioned to threadedly engage said external threads on said body and an inwardly tapering frustoconical inner surface surrounding said tapering outer surface portion of said sleeve,

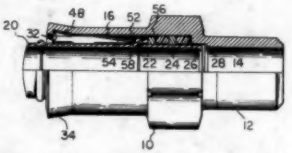
whereby threading said nut onto said body causes said inwardly tapering surface of said nut to contact said tapering outer surface portion of said sleeve and force said outer surface portion radially inwardly in a uniform fashion, closing said triangular slots and reducing the diameter of said smaller end to engage said conduit between said smaller end and said rib.

4,637,640

PUSH-IN CONNECT FITTING

Paul J. E. Fournier, Jackson, and Joseph F. Reinker, Jr., Parma, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Feb. 27, 1985, Ser. No. 706,442
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—319 **7 Claims**



1. A conduit system fitting characterized by its ease and simplicity of connection comprising, in combination, a first body having an axial passage, a conduit attachment end and a connection end, a recess defined in said body concentric with said passage intersecting said connection end adapted to receive an elongated tube having an end and an external shoulder axially spaced from said tube end, a shoulder defined in said recess adjacent said connection end, a stop defined in said passage engagable with said tube for limiting insertion of said tube within said passage, an annular sheet metal tube retainer fixed within said recess, said retainer being of an annular configuration having a central region, an inner end region and an outer end region, a plurality of cantilevered second resilient fingers each having free ends and located at said retainer inner end region longitudinally extending toward said stop and resiliently inwardly biased wherein the finger ends engage the tube shoulder upon the tube being fully inserted into the recess and a plurality of cantilevered first resilient elongated fingers separate and distinct from said second fingers each having free ends and located at said retainer outer end region extending toward said body connection end and resiliently biased outwardly whereby said first finger ends engage said recess shoulder adjacent said connection end maintaining said retainer within said recess.

4,637,641

ASSEMBLY MEANS FOR STANDARDIZED MECHANICAL JOINT FOR PIPELINE APPURTENANCES

Harold Kennedy, Jr., 18 Fox Hollow, Eastland, Tex. 76448

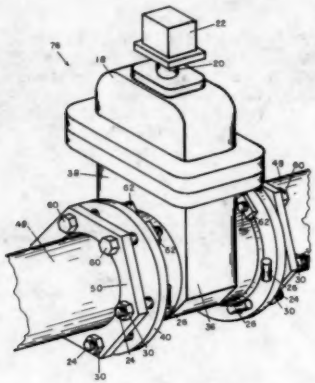
Filed Jun. 5, 1985, Ser. No. 741,680
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—337 **8 Claims**

1. An improvement in the standardized mechanical joint

connection for use on waterworks or gas pipeline appurtenances wherein the shape or dimensions of the body of said appurtenances preclude the insertion and tightening of the standardized T-bolts, said improvement comprising:

a. a screw having an externally threaded cylindrical portion, an hexagonally shaped head on one end of said externally threaded cylindrical portion, said hexagonally shaped head having the same dimensions across flats as the standardized nuts, said externally threaded cylindrical portion having length of such dimension that engagement of said externally threaded cylindrical portion with the internal threads of nut means is provided when a gland, gasket, socket, and spigot are contiguous prior to compression of said gasket, and interference with said externally threaded cylindrical portion is prevented when said screw is tightened and said gasket is compressed,

b. said nut means having an internally threaded elongated



shape so as to prevent turning during tightening, means to provide linear contact with a standardized mechanical joint bell flange surface, said nut means having adjacent surfaces sloping away from said linear contact so as to provide for axial misalignment of said screw,

c. whereby, as many standardized T-bolts as possible having been inserted through the bell flange bolt holes then through the gland bolt holes and threadably connected to standardized nuts, one said screw is inserted through each remaining said gland bolt hole and then through said bell flange bolt hole wherein the use of the standardized T-bolt is prevented, each said screw is threadably connected to said nut means, said screw heads and said standardized nuts being tightened from the gland side of said joint by consecutively or alternatingly connecting the same wrench means to the said hexagonally shaped heads of said screws and said standardized nuts, applying torque until said gasket is compressed and leakage is prevented.

4,637,642

STOWAGE BIN LATCH ASSEMBLY

Carl H. Stoecker, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US83/01998, § 371 Date Dec. 16, 1983, § 102(e) Date Dec. 16, 1983, PCT Pub. No. WO85/02645, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 16, 1983, Ser. No. 592,019

Int. Cl.⁴ E05C *3/30*

U.S. Cl. 292—129 **13 Claims**

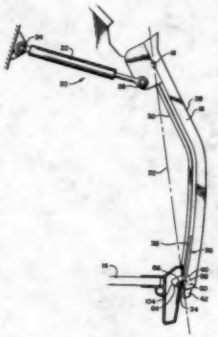
1. A latch assembly particularly adapted to latch a door, such as a door for a stowage bin where the door has a forward side and a rear side, an upper hinge end about which the door is mounted for swing motion about a door hinge axis and a lower swing end opposite to the hinge end, where said door has a closed position at which said door is substantially vertically aligned and is movable in a forward and upward direction to an open position, and where said door has a generally vertical door reference plane which, with the door in its closed position, is coincident with said hinge axis and said swing end, said latch assembly adapted to be mounted at the swing end of the door to latch the swing end to stationary structure, said latch assembly comprising:

a. a base member which has a latch reference plane and which is adapted to be located at and mounted to the swing end of the door in a manner that the latch reference plane is generally parallel to the door reference plane;

b. an actuating member mounted to the base member for substantially linear movement along a generally vertical operating path generally parallel with said latch reference plane between a lower latching position and an upper release position, said actuating member having a through opening, and upper and lower contact members located at upper and lower sides, respectively of said through opening;

c. a first main spring means to urge said actuating member downwardly to its latching position;

d. a latching arm having a forward pivot end by which the arm is pivotally mounted to the base member for rotation



about a latching axis which is generally parallel with the latch reference plane and located forwardly of the through opening of the actuating member, and a rear latching end where the arm has a hook member extending laterally from the latching arm and having a forwardly facing latching surface adapted to engage a matching striker member, said latching end being located rearwardly of the through opening of the latching member, said arm extending through said through opening and having a lengthwise axis extending from the pivot end of the arm to the latching surface, said arm being pivotally movable about said latching axis between a first lower latching position and a second upper release position;

e. said actuating member being arranged in a manner that upward movement of the actuating member causes the lower contact member to engage the latching arm at an intermediate location between the pivot end and the latching end to move the arm to said second release position, and downward movement of said actuating member causes the upper contact member to engage the latching arm at said intermediate location to move the arm to said first latching position; and

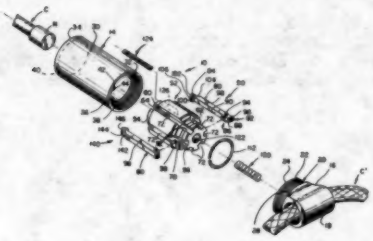
f. a second spring means operatively connected between said base member and said latching arm to urge the latching arm toward its release position.

4,637,643

AUTO-RELEASE LOGGING CHOKER

David D. Johnson, Booth, and Cleveland J. Biller, Morgantown, both of W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 1, 1985, Ser. No. 794,028
Int. Cl.[4] B66C 1/38; F16F 15/06
U.S. Cl. 294—75 12 Claims



1. A self-releasing coupling for releasably attaching a first element to a second element comprising:

a casing having attaching means for attaching said casing to the first element, and a ramp;

grasping means movably mounted in said casing for releasably grasping the second element, said grasping means having wedgelike engaging force generating means thereon which cooperate with said casing ramp for forcing said grasping means toward said second element and providing an engaging force between said grasping means and the second element which maintains said grasping means in engagement with the second element and increases as a separating force tending to separate the second element from said grasping means increases when said grasping means is in a first location within said casing with said casing ramp engaging said wedgelike engaging force generating means;

operating means on said grasping means for moving said grasping means into and element grasping configuration and into an element releasing/receiving configuration;

control means on said casing for placing said operating means into an element releasing/receiving configuration while said grasping means is in said element grasping configuration in said first location within said casing, said operating means being prevented from moving said grasping means into said element releasing/receiving configuration by said ramp and said wedgelike engaging force generating means and the separating force; and

moving means connected to said grasping means for moving said grasping means out of said first location when the separating force is released whereby said engaging force is released and said operating means automatically places said grasping means into said element releasing/receiving configuration.

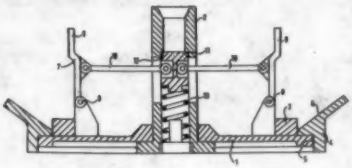
4,637,644

TIRE TRANSPORT JIG

Jack Trethowan, Birmingham, England, assignor to W & A Bates Limited, England

Filed May 9, 1985, Ser. No. 732,268
Claims priority, application United Kingdom, May 22, 1984, 8413084
Int. Cl.[4] B66C 1/54; B79H 5/02
U.S. Cl. 294—97 8 Claims

1. A tire transport jig comprising a horizontally disposed, fixed lower bead support, a concentric, horizontally-disposed fixed tire shoulder support and an upper bead holding device comprising a set of radially movable upper bead engagement members and means to effect said radial movement between a first position in engagement with an upper tire bead, and a second position out of engagement, said means to effect radial movement of the upper bead engagement members comprising a single control member and connected from the control member to each of the engagement members by connectors such that movement of the control member moves the engagement members in synchronization.

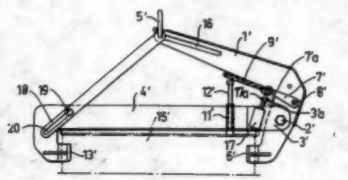


4,637,645

DEVICE FOR LIFTING AND HANDLING OBJECTS

Sven-Göran Eriksson, 8 Rymdvägen, S-981 44 Kiruna, Sweden

PCT No. PCT/SE84/00334, § 371 Date Jun. 13, 1985, § 102(e) Date Jun. 13, 1985, PCT Pub. No. WO85/01720, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 11, 1984, Ser. No. 744,813
Claims priority, application Sweden, Oct. 13, 1983, 8305366
Int. Cl.[4] B66C 1/42
U.S. Cl. 294—104 2 Claims



1. A device for lifting and handling objects, including cylindrical objects, comprising a lifting arm having a substantially vertical clamp portion and a substantially horizontal actuating portion provided with a lifting means, a yoke having a substantially vertical clamp portion having ends and a substantially horizontal portion, said clamp portion of the lifting arm being, between its ends, pivotally connected to a free end of the substantially horizontal portion of the yoke, clamping jaws mounted on the clamp portions of the lifting arm and the yoke for engagement with diametrically opposite sides of an object to be lifted, a locking mechanism for releasably locking said lifting arm to the yoke in open position and means for releasing said locking mechanism in downward swinging movement of the actuating portion of the lifting arm to allow the closing of the clamping jaws in order to grip the object to be lifted, said lifting means being arranged for free movement in a slot provided in the actuating portion of the lifting arm and being connected to one end of a link means, said link means having an opposite end portion pivotally connected to the yoke remote from that end thereof which is pivotally connected to the clamp portion of the lifting arm.

4,637,646

WHEEL SET FOR RAIL VEHICLES

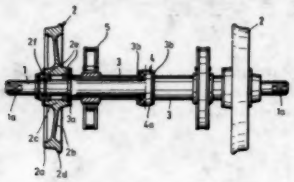
Hermann Ortwein, Cologne; Ottmar Krettek, and Johannes Nicolin, both of Aachen, all of Fed. Rep. of Germany, assignors to Clouth Gummiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,576

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1983, 3341950

Int. Cl.[4] B60B *37/00*

U.S. Cl. 295—37 7 Claims



1. A torsionelastic wheel set for a railway vehicle comprising:

a shaft;

a pair of axially spaced track-entrained railroad-rail wheels independently journaled on said shaft and rotatable relative to said shaft and to one another;

respective hollow shaft sections connected to each of said wheels and disposed between said wheels, said shaft extending through said sections, said shaft sections being cylindrical and extending toward a location substantially centrally disposed between said wheels, each of said shaft sections having a flange adjoining said location; and

an annular elastic coupling at said location between said hollow shaft sections coaxial therewith and securing them together substantially midway between the wheels for limited elastic relative angular displacement and generating a restoring force reestablishing an original angular orientation of said hollow shaft sections, said coupling being axially sandwiched between said flanges.

4,637,647

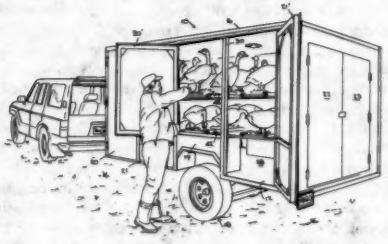
FIELD DECOY TRANSPORT DEVICE

Franklin O. Bunting, and J. Russell Hudson, both of Dagsboro, Del., assignors to Richard W. Gaffney, Brooklyn Heights, N.Y. and Oliver M. Walker, Bethesda, Md.

Filed Feb. 24, 1986, Ser. No. 833,354

Int. Cl.[4] B60R *7/00*

U.S. Cl. 296—24 R 11 Claims



1. Apparatus for transporting and storing a set of taxidermied water fowl decoys such as Canada geese mounted on rectangular bases comprising:

(a) wheeled enclosure means having a floor, side walls and a roof and trailer attachment means for vehicle towing;

(b) a plurality of horizontal pairs of opposing channel members mounted transversely on the floor of the enclosure means and at at least one level thereabove from side wall to side wall in vertical alignment therewith;

(c) said channel pairs slidably receiving the decoy bases to retain a side by side row of said decoys; and

(d) the side walls, of said enclosure means having vertical door means for each vertical stack of channel pairs positioned to permit the transverse withdrawal and insertion of said decoys.

4,637,648

REAR SEAT BACK LOCKING ARRANGEMENT FOR A MOTOR VEHICLE AND THE LIKE

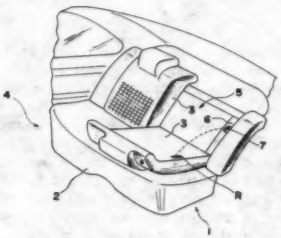
Kiyomi Okino, and Takumi Muramoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation and Delta Kogyo Co., Ltd., both of Hiroshima, Japan

Filed Aug. 5, 1985, Ser. No. 762,314

Claims priority, application Japan, Aug. 7, 1984, 59-121576[U]

Int. Cl.[4] B60N *1/10*

U.S. Cl. 296—63 8 Claims



1. A rear seat back locking arrangement for a motor vehicle and the like which comprises:

(a) a rear seat back arranged to partition an interior of a passenger compartment of the motor vehicle from an interior of a trunk room thereof so as to be capable of being turned down forwardly about its lower edge and having a recess formed adjacent to a peripheral edge at its rear surface in a position confronting a vehicle body when erected,

(b) a striker means fixed at the vehicle body side to confront said recess of the rear seat back and adapted to project toward the rear surface of said rear seat back so as to be fitted into said recess, and

(c) a rear seat back locking means provided on the rear seat back and having a lock means and an operating means, said lock means provided in said recess further including an engaging means engageable with said striker means so as to make it possible to lock the rear seat back, and a releasing means which enables the engaging means to be released from the locked state in association with movement of the operating means, said operating means which effects locking and unlocking of said lock means including a moving means to be moved through manual operation, and a cancelling means positioned between the moving means and the releasing means, said cancelling means cancelling the lock releasing function of said releasing means by the moving means, while permitting movement of said moving means.

4,637,649

LATCH MECHANISM FOR REMOVABLE ROOF PANEL

Emanuel F. Cambria, Tannersville, Pa., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed May 13, 1985, Ser. No. 733,327

Int. Cl.[4] B60J *7/19*; E05B *13/10, 55/06*

U.S. Cl. 296—224 14 Claims

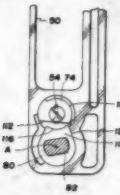
1. A latch mechanism for fastening a hatch panel in a com-

plementary roof opening in the roof of an automobile comprising:

latch means carried by the hatch panel for selectively interlocking the hatch panel with respect to the automobile roof within the roof opening;

operator means for actuating said latch means having an operator member and means for displaceably mounting said member to the latch panel for movement between a closed position corresponding to engagement of the latch means, and an open position corresponding to disengagement of the latch means; and

control means carried by the operator means for selectively coupling said latch means to said operator means in an unlocked mode corresponding to direct interconnection of said operator member and said latch means and a



locked mode corresponding to limited interconnection of said operator member and said latch means, said control means having:

a first means for coupling the latch means and the operator member when the unlocked mode of said control means is selected to effect movement of the latch means in correspondence to the movement of the operator member;

a second means for locked mode coupling of said latch means and said operator member in response to movement of the operator member from the open position; and

a third means for locked mode decoupling of said latch means and said operator member during subsequent movement of said operator member.

4,637,650

TOP COVER MEMBER FIXING ARRANGEMENT IN A VEHICLE SEAT

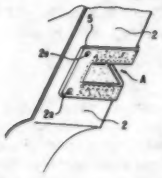
Nobuhiro Inoue, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Dec. 26, 1984, Ser. No. 686,233

Claims priority, application Japan, Dec. 27, 1983, 58-199849[U]

Int. Cl.[4] A47C *1/10*

U.S. Cl. 297—410 **4 Claims**



1. In a vehicle seat having a top cover, the top cover having a cut-out formed therein and having an edge portion surrounding the cut-out, apparatus for securing the top cover edge portion surrounding the cut-out, the apparatus comprising:

a frame member, the frame member having a body formed as one of a plate and a wire, the frame member having a shape which conforms to the shape of the cut-out, the frame member being disposed adjacent to the top cover edge portion surrounding the cut-out;

a plate-like piece, the piece including a plate-like base portion and a protruding portion joined to and protruding from the base portion, the protruding portion having a thickness which is greater than that of the base portion, the plate-like piece being mounted on the top cover adjacent to the cut-out, the base portion being secured to the top cover edge portion surrounding the cut-out, the frame member and the plate-like piece being positioned relative to each other such that the protruding portion of the piece is more closely disposed to the cut-out than the frame member; and

a holding member, the holding member being formed as a rim positioned adjacent to and surrounding the cut-out, the plate-like piece being interposed between the frame member and the holding piece and being securely held therebetween, thereby securing the edge portion of the top cover.

4,637,651

SEAT PLATE

Gustaf A. Sperr, Trollhättan, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

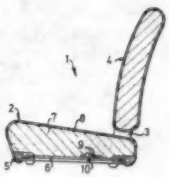
PCT No. PCT/SE84/00270, § 371 Date Apr. 4, 1985, § 102(e) Date Apr. 4, 1985, PCT Pub. No. WO85/00735, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 7, 1984, Ser. No. 719,277

Claims priority, application Sweden, Aug. 10, 1983, 83043471

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—458 **8 Claims**



1. A seat plate in a seat, for supporting the pelvis of a person sitting on the seat, the seat plate being formed on its upper side with two raised, scythe-like ridges which are symmetrically located about a longitudinal center line, one on each side of the center line, each ridge including a substantially transverse ridge portion which outwardly curves slightly backwards and tapers into a basic plane for the seat plate, each ridge also including a substantially longitudinal ridge portion which backwardly curves slightly outwards and tapers into the basic plane for the seat plate, the ridges being contoured to support the seat bone protuberances of the pelvis substantially on their forward and inner side.

4,637,652

PIECE OF FURNITURE

Henning Bergenwall, Sandviken, Sweden, assignor to Mölnlycke Konsumentprodukter AB, Mölnlycke, Sweden

Filed Sep. 3, 1985, Ser. No. 772,138

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—90 **16 Claims**

1. A piece of furniture, comprising:

a stand a seat, a back support pivotable with respect to said seat, and an upwardly and downwardly pivotable leg support provided with a foot-rest;

at least one operating means pivotably connected with said seat and said support for movement thereof backwardly from a sitting position, in which the feet of a user are resting on said foot-rest, and for a simultaneous pivoting

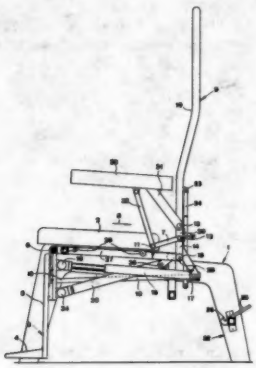
of said leg support upwardly and forwardly to cause a relative movement between said foot-rest and said seat such that knee-adjacent leg portions of the user remain in supporting contact with the supporting areas of the piece of furniture;

said seat being movably arranged in a direction forwardly and backwardly relative said stand through pivoting of said back support;

said leg support being pivotably connected to said stand about a pivot axis fixed with respect to said stand for all movements relative to said stand, said foot-rest being located at a constant distance from said pivot axis during the pivoting of said leg support upwardly and downwardly;

said operating means upon pivoting of said leg support upwardly and forwardly imparting movement of the seat in a direction backwardly relative to said stand and thereby relative to said pivot axis of said leg support, and said operating means comprising at least one link extending between a point on said seat and a point on said back support;

an intermediate part having a first part pivotally hinged through a front hinge to said seat and a second part pivotally hinged through a second hinge to said back support for pivoting of said back support;



power means associated with said intermediate part through said seat for pivoting said support in response to said seat imparting movement to said intermediate part;

said back support having first and second portions, said first portion being connected to said intermediate part about said second hinge so that said first portion extends outwardly from said second hinge, and when said back support is from said second hinge, and when said back support is pivoted to a normal sitting position said first portion extends upwardly and substantially forms the real back supporting part of the back support, and said second portion extends downwardly;

means associated with at least one of said intermediate part and said back support for limiting the pivoting of said first portion of said back support backwardly relative to said intermediate part; and

said link being to said second portion of said back support, wherein said first portion of said back support is arranged to, at the backward pivoting of said back support, enter into supporting engagement with a portion of said stand in such a way that continued influence by said power means on said intermediate part for pivoting thereof in the direction backwardly gives rise to pivoting of said back support relative to said intermediate part so that said first portion of said back support is pivoted upwardly and so that said second portion of said back support is moved at least one of backwardly and downwardly and thereby via said link actuates the seat in the backward direction.

4,637,653

REAR SEAT CUSHION IN MOTOR VEHICLE

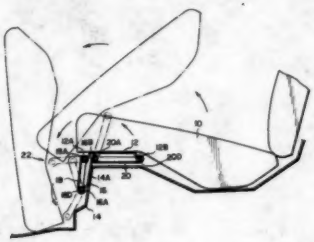
Takeshi Yoshida, Nagoya; Takayasu Honda, Toyota; Shunosuke Kitazume, Takarazuka, and Kouzou Tanaka, Toyonaka, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Daihatsu Motor Co., Ltd., both of, Japan

Filed Dec. 27, 1985, Ser. No. 813,966

Claims priority, application Japan, Dec. 28, 1984, 59-198872[U]

Int. Cl.[4] B60N *1/10*

U.S. Cl. 297—334 **24 Claims**



1. A rear seat cushion for a motor vehicle, wherein the seat cushion is designed to be rotated forwardly to an erect position to expand the loading space in the rear portion of the vehicle compartment, having

a quadric rotary link mechanism comprises a seat cushion side link connected to said seat cushion substantially horizontally with reference to the longitudinal direction of the vehicle, a floor side link connected to the vehicle floor downwardly from the forward end of said seat cushion and substantially vertically with reference to the longitudinal direction of the vehicle, a lower link pin-connected at opposite top and bottom ends thereof to the forward end portion of said seat cushion side link and the bottom end portion of said floor side link, respectively, and an upper link pin-connected at opposite rear and forward ends thereof to the rear end portion of said seat cushion side link and the top end portion of said floor side link, respectively, and

said seat cushion being secured to the floor through said quadric rotary link mechanism.

4,637,654

ARMCHAIR WITH TILTING SEAT

Paul A. Boardman, 16 Woodman's Way, Bishops Cleeve, Cheltenham GL524DP, England

Filed Feb. 19, 1985, Ser. No. 702,654

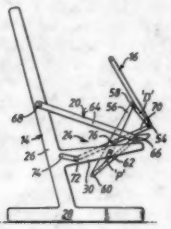
Claims priority, application United Kingdom, Jun. 18, 1984, PCT/GB84/00215

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—337 **16 Claims**

1. An armchair having a seat tiltable relative to a fixed frame of the chair to provide aid to an occupant in rising from the chair, the seat being tiltable from a lowered position to a raised position by a lever mechanism provided beneath the seat, characterised in that the lever mechanism is operatively connected to at least one pivotal arm assembly of the chair and is actuated by downward movement of that arm by force exerted thereon by the occupant in rising from the chair, the fixed frame of the seat comprising a cantilevered support element about which the lever mechanism is pivotal and in that locking means is provided to lock said pivotal arm assembly relative to the support element and thereby arrest movement of the lever mechanism when the chair is in use, said pivotal arm assembly

comprising a pivotal arm pivotally mounted to a part of the fixed frame above said cantilevered support element and a connecting strut having one end pivotally connected to the pivotal arm remote from its pivotal mounting and an opposite



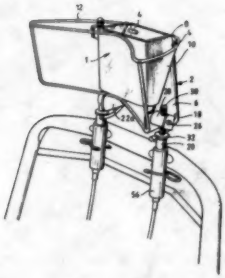
end connected to one end of a main tilting lever of the lever mechanism said opposite end of the arm also incorporating the locking means by which the pivotal arm assembly is locked relative to the fixed frame.

4,637,655

ADJUSTABLE HEAD-REST FOR A MOTOR VEHICLE SEAT OR THE LIKE

Francois Fourrey, Montbeliard, and Pierre Caburet, Valentigney, both of France, assignors to Cycles Peugeot, Valentigney, France

Filed Aug. 1, 1985, Ser. No. 761,277
Claims priority, application France, Aug. 3, 1984, 84 12360
Int. Cl.[4] A47C *1/10*
U.S. Cl. 297—410 **10 Claims**



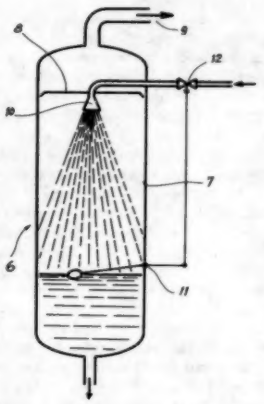
1. An adjustable head-rest for a seat, comprising a fixed mount for fixing on the seat, a first semi-case and a second semi-case, pivot means pivotally interconnecting the two semi-cases in upper parts of the two semi-cases for relative pivotal movement about a first pivot axis, the first semi-case being pivotally mounted in a lower part thereof on the mount to pivot relative to the mount about a second pivot axis, a frame of a padding cushion for supporting a user's head and carried by the second semi-case, a first control device and a second control device mounted respectively in a first position and a second position directly on said mount for respectively adjusting angular positions of the first semi-case and second semi-case about said pivot axes relative to said mount, each semi-case having a lateral wing, first connecting means connecting the first control device to the wing of the first semi-case and second connecting means connecting the second control device to the wing of the second semi-case in an upper part of the wing of the second semi-case in a position adjacent to but spaced from said first pivot axis, said second position of the mounting of the second control device on said mount being spaced from said second pivot axis, and said first and second pivot axes, said second connecting means and said second position forming substantially a deformable parallelogram structure, the second control device and said second connecting means being such as to allow pivotal movements of said semi-cases relative to said mount about said pivot axes when adjusting their angular positions relative to said mount by means of said control devices but maintaining said second connecting means at a fixed distance from the mount determined by the adjustment effected by the second control device so that the pivoting of the first semi-case about said first pivot axis shifts the cushion frame in a substantially horizontal direction while maintaining the cushion frame substantially in the same angular position relative to the mount and the pivoting of the second semi-case by means of the second control device for adjusting purposes does not affect the position of the first semi-case relative to the mount and adjusts the position of the cushion frame in a substantially vertical direction relative to the mount.

4,637,656

WATER JET SCARIFYING APPARATUS

Renzo Medeot, Mossa, Italy, assignor to FIP Industriale S.p.A., Selvazzano Dentro Padova, Italy

Filed Jun. 20, 1985, Ser. No. 746,954
Claims priority, application Italy, Jul. 3, 1984, 21737 A/84
Int. Cl.[4] E21C *25/60*; E01C *23/12*
U.S. Cl. 299—1 **4 Claims**



1. A hydraulic scarification apparatus comprising a nozzle positioned at one end of a hollow shaft, a ball joint supporting said hollow shaft, high pressure pump means supplying water to said hollow shaft for delivery from said nozzle towards a surface to be scarified, de-gassing means positioned upstream of said high pressure pump, electronic control means operable to maintain said nozzle constantly at a predetermined height above the surface to be scarified, means for the removal of the scarified loose material and water from the region of impact of the water jet with the surface to be scarified, said nozzle being enclosed within a scarification head on which it is supported by said ball joint in such a way as to be freely movable within said scarification head, displacement of said nozzle being effected by nozzle displacement means including a linkage between said nozzle and said scarification head, said degassing means including a water container, a screen in said container, spray means operative to deliver water into said container, suction outlet means from said container leading to means for creating a partial vacuum in said container, said screen being positioned between said spray means and said suction outlet means whereby to prevent the passage of water droplets pro-

duced by said spray means, and level regulator means operating to control the flow of water to said spray means whereby to regulate the level of water in said container.

4,637,657

TUNNEL BORING MACHINE

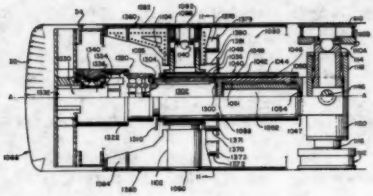
Larry L. Snyder, Golden, Colo., assignor to Harrison Western Corporation, Golden, Colo.

Continuation-in-part of Ser. No. 461,683, Jan. 27, 1983, Pat. No. 4,527,837. This application Mar. 29, 1984, Ser. No. 594,923

The portion of the term of this patent subsequent to Jul. 9, 2003, has been disclaimed.

Int. Cl.[4] E21D *9/08*

U.S. Cl. 299—31 **18 Claims**



17. An elongated tunnel boring machine, having a central longitudinal machine axis, for boring a linear tunnel section in a linear boring mode of operation or a curvilinear tunnel section in a curvilinear boring mode of operation; the tunnel having an end face and a peripheral side wall including a floor portion, a ceiling portion, and opposite side wall portions spaced from a central longitudinal tunnel axis; and the tunnel boring machine comprising:

rotatable cutting wheel means at the front end of the machine and having a central axis of rotation which is coaxial with the machine axis and adapted to be selectivley located at a desired position approximately at the laterally opposite portion of the central longitudinal tunnel axis and held against the tunnel face during rotation ½ for cutting material away from the tunnel face during rotation] for cutting material away from the tunnel face to elongate the tunnel and extend the central longitudinal tunnel axis in a selected direction;

extendible and retractable thrust means, including forwardly extending piston-rod means operably associated with said cutting wheel means and rearwardly extending cylinder means operably supporting said forwardly extending piston-rod means, and a plurality of annular thrust devices operatively attached to an annular device, for selectively causing forward movement of said cutting wheel means against the tunnel face in the cutting mode of operation said piston rod means being selectively extendable to cause forward relative axial movement to move the cutting wheel means forwardly during a cutting stroke and being retractable to move said cylinder means forwardly relative to said cutting wheel means to prepare the piston rod means for the next cutting stroke;

motor means operatively connected to said rotatable cutting wheel means for selectively causing rotation thereof in a cutting mode of operation and stopping rotation thereof in a non-cutting mode of operation;

extendible and retractable rear end clamping and positioning means for locating and holding the rear end portion of the machine between opposite tunnel side wall portions with the rear end portion of the central longitudinal machine axis located in approximately coaxial relationship with the laterally adjacent portion of the central longitudinal tunnel axis in the linear boring mode and being selectively movable between outwardly extended engaging positions and inwardly retracted non-engaging positions relative to the tunnel wall to facilitate repositioning of the machine;

pivotal connecting means between said rear end clamping and positioning means and the rear end portion of the machine to provide at least one pivotal axis which intersects the central longitudinal machine axis for enabling the central longitudinal machine axis to be laterally pivotally displaced relative to the central longitudinal tunnel axis about said pivotal axis during a cutting stroke in the curvilinear boring mode of operation; and

extendible and retractable from end clamping and positioning means for fixedly locating and holding the front end portion of the machine between the opposite tunnel side wall portions with the central longitudinal machine axis located in approximately coaxial fixed relationship with the central longitudinal tunnel axis in the linear boring mode and for adjustingly locating and holding the front end portion of the machine between opposite tunnel side wall portions during a cutting stroke with the central longitudinal machine axis in variably displaced laterally offset relationship with the central longitudinal tunnel axis of the last bored tunnel portion in the curvilinear boring mode by lateral pivotal displacement about said pivotal axis.

4,637,658

CUTTERS FOR USE IN MINERAL MINING

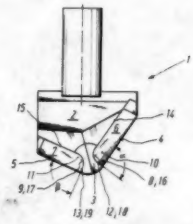
Wolfgang Annipajo, Lunen; Oswald Breuer, Dortmund, and Christoph Rassmann, Lunen, all of Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,852

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433277

Int. Cl.[4] E21B *10/00*

U.S. Cl. 299—79 **6 Claims**



1. A cutter for use with mineral mining machines; said cutter having a body, a pair of hard metal plates mounted to the body, the hard metal plates providing first and second cutting edges disposed exteriorly of the body, the first and second cutting edges lying in first and second planes, respectively, which are inclined to one another and intersect at a corner junction, a hard metal pin mounted to the body at the corner junction between said hard metal plates; wherein the pin merges smoothly with the cutting edges and is provided with circumferential recesses which receive and support adjacent end zones of the plates.

4,637,659

TOOL MEMBER FOR A ROTARY DRILLING TOOL

Fritz Tibussek, Mönchengladbach, Fed. Rep. of Germany, assignor to Wirth Maschinen- und Bohrgerate-Fabrik GmbH, Erkelenz, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,305

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337931

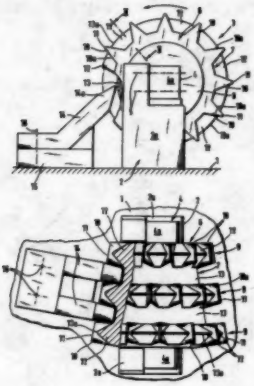
Int. Cl.[4] E21B *10/16*

U.S. Cl. 299—89 **5 Claims**

1. A rotary tool member for a drilling tool, comprising:

a body having an axis of rotation, spaced-apart teeth dis-

posed in at least one annular peripheral region of said body, each of said teeth having flanks and a tip, and peripheral ribs extending to said flanks in regions between



said teeth, said ribs each having a cross-section descending on each rib on side from a peak rib region having a lower height than a height of said tip in a radial direction from said axis of said body.

4,637,660

METHOD FOR CONNECTING BRISTLES TO A BRISTLE CARRIER

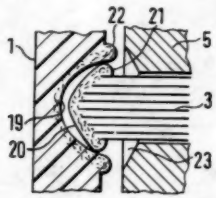
Georg Weihrauch, Waldmichelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Waldmichelbach, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,639

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403341

Int. Cl.[4] A46D *3/04*

U.S. Cl. 300—21 **7 Claims**



1. A method for connecting bristles to a bristle carrier both of which are made of thermoplastic material, said method comprising the steps of:

melting a bundle of such bristles at one end to such an extent that a reversal of their oriented, stretched molecular form takes place converting the molecules to a non-oriented balled form and thereby thickening the bristle ends to form a thickening on said one end of said bundle,

melting said bristle carrier at a bristle receiving surface,

forming a recess in the melted material of said bristle carrier for receiving said bristle bundle,

during the forming of said recess displacing the material of said bristle carrier to form a bead surrounding said recess and extending outwardly from said bristle receiving surface of said bristle carrier, and

inserting said thickening of said bristle bundle into the melted bristle carrier until the melt of the bristle carrier flows around and thereby encloses said thickening of said bundle.

4,637,661

DECELERATION-BALANCED TYPE BRAKE PRESSURE CONTROL VALVE ASSEMBLY

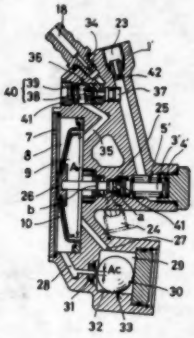
Teruhisa Kohno, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 12, 1985, Ser. No. 764,881

Claims priority, application Japan, Aug. 24, 1984, 59-177309

Int. Cl.[4] B60T *8/00*

U.S. Cl. 303—24 A **3 Claims**



1. A deceleration-balanced type brake pressure control valve assembly for a vehicle comprising: a vacuum pressure regulating means for generating a controlled vacuum pressure proportional to the deceleration of the vehicle; a fluid motor responsive to differences in atmospheric pressure and the controlled vacuum pressure obtained by said vacuum pressure regulating means;

an inertia body adapted to be acted upon by the deceleration of the vehicle; a valve means having a plunger for opening and closing a passage connecting an inlet of brake fluid with an outlet thereof; sand fluid motor being operatively connected to said plunger;

a spring for urging said plunger in a valve opening direction; said plunger being responsive to the brake fluid pressure and adapted to open and close said valve means when moved axially by the brake fluid, and urged by the fluid pressure at the fluid inlet and said spring in a valve opening direction and urged by the fluid pressure at the fluid outlet and said fluid motor in a valve closing direction;

said valve means being normally kept open by said spring, characterized in that said controlled vacuum pressure is substantially equal to atmospheric pressure until the deceleration of the vehicle reaches a predetermined level, and that said inertia body is disposed in a chamber acted upon by said controlled vacuum pressure.

4,637,662

ANTI-LOCKING MODULATING VALVE FOR DISPLACEMENT TYPE FULL POWER MASTER CYLINDER

G. Emerson Brown, Niles, Mich., assignor to Allied Corporation, Morristown, N.J.

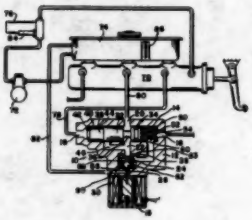
Filed Oct. 18, 1985, Ser. No. 789,202

Int. Cl.[4] B60T *8/02, 13/18, 13/68*

U.S. Cl. 303—6 R **8 Claims**

1. An integrated isolation/modulation valve for use in an anti-lock braking system which includes at least one brake wheel cylinder, a manually modulated source of pressurized brake fluid having an output and a return and operable to apply pressurized brake fluid to said brake wheel cylinder, and con-

trol means for generating brake pressure control signals in response to behavior of a wheel, comprising: a valve body having a bore, a differential pressure valve element therein reciprocal in said bore between first and second operating positions in response to a differential pressure thereacross, a first inlet port connecting one end of said bore to said manually modulated source output, a second inlet port connecting said bore to said manually modulated source output, an outlet port connecting the other end of said bore to said wheel cylinder, a decay port connected to said return, and a modulating valve means for normally providing communication between one of said input ports and said output port and closing said decay port and operable to a second position interrupting fluid communication between said one of said inlet ports and said outlet port and opening said outlet port to said decay port to cause said fluid pressure differential across said differential pressure valve element, biasing means biasing said differential pressure valve element to said first position to provide communication between said one of said inlet ports and said outlet port in the absence of said differential pressure, said differential pressure valve element blocking communication therebetween when in said second position, and orifice means communicating between said one of said inlet ports and said outlet port when said differential pressure valve element is in said second position for providing restricted flow of pressurized fluid therebetween when said differential pressure valve element is in said second position.



4,637,663

ANTI-SKID BRAKE CONTROL SYSTEM PERFORMING SKID CONTROL WITH BOTH OPEN AND CLOSE FEEDBACK TECHNIQUES

Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

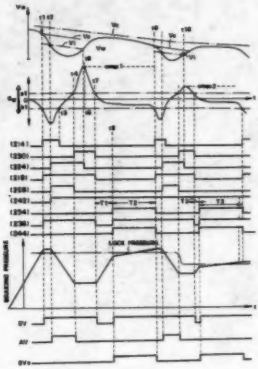
Filed Jul. 26, 1984, Ser. No. 634,489
Claims priority, application Japan, Aug. 11, 1983, 58-145647
Int. Cl.[4] B60T 8/70
U.S. Cl. 303—106 **25 Claims**

1. An anti-skid brake control system for an automotive brake system comprising:

a hydraulic brake system including a wheel cylinder for applying braking pressure to a vehicle wheel, and a pressure control valve means including a pressure control valve associated with said wheel cylinder for adjusting fluid pressure in the wheel cylinder at a given first and second rate, said pressure control valve being operative to increase fluid pressure in said wheel cylinder in a first position, to decrease fluid pressure in a second position and to hold fluid pressure in said wheel cylinder constant in a third position;

a wheel speed sensor detecting rotation speed of the wheel and producing a wheel speed indicative signal having a value indicative of the detected wheel speed;

a controller deriving a wheel acceleration value based on said wheel speed indicative signal and a control signal for controlling operation of said pressure control valve to operate the latter in one of said first, second and third positions to control the wheel speed at a given optimal relationship to a vehicle speed, said controller deriving a wheel acceleration dependent value on the basis of the peak of said wheel acceleration value and controlling the pressure control valve in one cycle of anti-skid control in accordance with a predetermined schedule, in which fluid pressure in the wheel cylinder is increased at said given first rate for a period of time variable according to said wheel acceleration dependent value and subsequently said controller controlling said pressure control valve means for increasing fluid pressure in the wheel cylinder at said given second rate, smaller than said first rate after expiration of said period of time during operation of said pressure control valve in said first position.

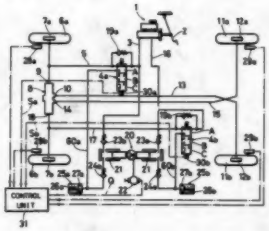


4,637,664

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A B S, Ltd., Kanagawa, Japan

Filed Jul. 30, 1985, Ser. No. 760,356
Claims priority, application Japan, Jul. 31, 1984, 59-162046
Int. Cl.[4] B60T 8/04
U.S. Cl. 303—111 **5 Claims**



1. In a skid control apparatus for a vehicle braking system of the type comprising a master cylinder and wheel cylinders associated with front and rear wheels, fluid pressure control valve means arranged between the master cylinder and wheel cylinders, a control unit adapted to sense skid conditions, hydraulic reservoir means, and fluid pump means, the improvement wherein a separate fluid pressure control valve means is provided for each one of a pair of front wheel cylinders, and a valve apparatus arranged between said pair of front wheel cylinders and the cylinders of a pair of rear wheels, said valve apparatus normally being open to fluid pressures applied to all said wheel cylinders through the respective fluid pressure control valve means, and wherein sensing of skid conditions at one front wheel cylinder operates the one fluid pres-

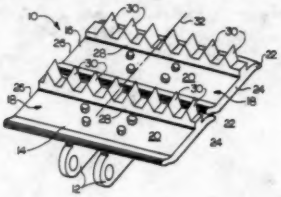
sure control means associated with that front wheel cylinder to vary the fluid pressure to said one front wheel cylinder, and means including said valve apparatus connecting said one fluid pressure control means to one of said rear wheel cylinders to also vary the fluid pressure to said one rear wheel cylinder.

4,637,665

TRACK SHOES HAVING TOOTHED GROUSERS

Jon S. Burdick, N. Pekin, and Paul T. Corcoran, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 12, 1985, Ser. No. 797,293
Int. Cl.⁴ B62D *55/28*
U.S. Cl. 305—54 **9 Claims**



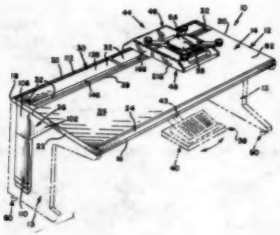
1. A track shoe for an endless track assembly, comprising:
a generally rectangularly shaped body having a ground engageable surface, a leading end portion, and first and second edge portions;
a grouser bar formed integrally with said body and extending outwardly away from said ground engageable surface, said grouser offset toward said leading end portion and extending across said ground engageable surface between said first and second edge portions;
said grouser having at least four teeth substantially equally spaced across said grouser, each tooth having a leading end portion, a trailing end portion, and a tip edge between said leading and trailing end portions, said tip edge being in a plane which is substantially parallel to said first and second edge portions and tapering downwardly at an acute angle relative to said ground engageable surface from said leading end portion to said trailing end portion, said angle being in the range of 10 to 30 degrees.

4,637,666

OFFICE FURNITURE DESK TOP WITH ADJUSTABLE CRT CARRIAGE AND TRACKING ARRANGEMENT THEREFOR

Williams R. Worrell, Hopkins, Minn.; Robert N. Laroche, Montreal, and Michael J. Armstrong, Beaconsfield, both of Canada, assignors to All-Steel Canada Ltd., Montreal, Canada

Filed Jun. 4, 1985, Ser. No. 741,176
Int. Cl.⁴ A47B *17/00*
U.S. Cl. 312—196 **5 Claims**



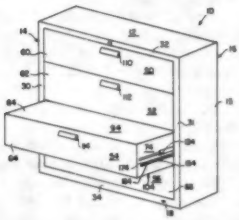
1. In an office furniture desk including a generally flat desk top and leg means for supporting same from a floor in a substantially horizontal position, with the desk top having oppositely disposed front and rear portions extending between right and left hand side portions on either side of the desk top,
the improvement wherein:
the desk top defines along its front portion a wide and flat upwardly facing work surfacing that extends between its side portions and rearwardly of the desk top toward the desk top rear portion a major proportion of the desk top width, and
the desk top defines along its rear portion a narrow trackway that extends between the desk top side portions with the trackway having its upper surfacing in substantially coplanar relation with said work surfacing,
said improvement further including:
a carriage riding on said trackway for movement the length thereof,
said carriage comprising a rear casing member rollably mounted on said trackway and a front casing member carried by said rear casing member in overhanging relation to said work surfacing,
means for mounting said front casing on said rear casing for rectilinear movement forwardly and rearward of said work surfacing with respect to said rear casing,
said front casing including a turntable assembly defining a rotatable platform structure on which read out equipment may be rested on said carriage against gravity,
said turntable assembly comprising:
a swivel mechanism secured to said front casing member defining a pivot axis that is disposed substantially normally of the desk top work surfacing,
said swivel mechanism defining an upper plate member pivotable about said axis,
a plurality of rectilinear arms carried by said plate member and disposed to extend substantially radially of said axis and having like ends of same projecting laterally outwardly of said turntable assembly,
a cover member overlying the other ends of said arms, and
means for releasably clamping said arm other ends between said cover member and said plate member,
said arms at the respective like ends each carrying a load support disc for receiving the read out equipment to be rested on said carriage.

4,637,667

POSITIVE INTERLOCK FOR FILE CABINET

Iain K. Reid, Scarborough; Eric Staite, Toronto; Doug Richmond, and George Rumbelow, both of Scarborough, all of Canada, assignors to Joyce International, Inc., Great Neck, N.Y.

Filed May 16, 1985, Ser. No. 734,832
Int. Cl.⁴ E05B *65/46*
U.S. Cl. 312—217 **15 Claims**



1. An interlock mechanism for the storage members of a storage cabinet for preventing movement of more than one storage member at a time from a storage position within the cabinet to a position extending from the cabinet; the storage cabinet having a plurality of storage members each disposed in

the cabinet for movement between the storage position and the extended position; the interlock mechanism comprising:

(a) interlock track means fixedly secured to an identical side of each of said storage means;

(b) interlock bar means including a plurality of interlock bars each movably arranged in a stack one above the other at a side of said cabinet and in proximity to said interlock track means, their being one less interlock bar than the number of storage members in said plurality of storage members;

(c) actuator block means carried by each of said interlock bars and proximity to said interlock track means for cooperation therewith; and

(d) extender means carried by each of said interlock track means for relative movement with respect thereto between an extended position and a retracted position;

(e) said interlock track means of a predetermined one of said storage members, upon movement of the storage member from its position within the cabinet towards its position extending therefrom, coacting with said actuator block means of a predetermined one of said interlock bars and thereby to prevent movement of all others of said storage members;

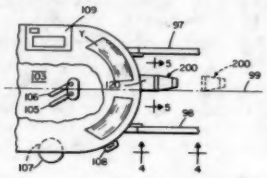
(f) said extender means being disposed to coact with said actuator block means of said predetermined interlock bar upon movement of said predetermined storage member a first distance extending from the cabinet, and such that continued movement of said storage member to a second distance extending from said cabinet effects relative movement of said interlock track means carried by said storage member so moving and said extender means carried thereby.

4,637,668

LOCOMOTIVE SAFETY DEVICE

David R. Kleffman, 3921 Park Ridge Rd., North Platte, Nebr. 69101, and Leroy V. Phiffer, 7209 Hawthorne Dr., Cheyenne, Wyo. 82009

Filed Nov. 21, 1985, Ser. No. 800,323
Int. Cl.[4] H01R *31/08*
U.S. Cl. 339—10 **8 Claims**



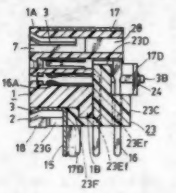
1. For the environment of a longitudinally extending and diesel engine type railroad locomotive classified under a stopped and "blue flag" condition, said locomotive having its traction wheels powerable from a high-voltage main-generator, said locomotive also being equipped with a low-voltage auxiliary-generator having electrical circuitry connected to locomotive installed alarm means, to at least one fuel valve for the diesel engine, to locomotive forward-rearward motive directional control, and to locomotive acceleration control, said low-voltage electrical circuitry extending the locomotive longitudinal length and terminating as two endward multi-pins receptacles, the improvement of a locomotive safety device tending to enforce upon would be locomotive operators said "blue flag" condition, said locomotive safety device being adapted to removably engaged with a said locomotive multi-pins receptacle and comprising: a multi-perforate plug including electrically conductive bushings adapted to be removably inserted into electrically conductive relationship with appropriately selected individual pins of said multi-pins receptacle, one of said plug bushings being adapted to removably engage a receptacle pin corresponding to that for the locomotive alarm means and others of said plug bushings being adapted to removably engage receptacle pins corresponding to those for said forward-rearward motive directional control, whereby any attempt by a would be locomotive operator to actuate the forward-rearward motive directional control will set off the alarm means to the discernments of the said interiorally positioned operator and to the externally positioned locomotive maintenance personnel.

4,637,669

CONNECTOR SOCKET

Kyousuke Tajima, Gunma, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 791,869
Claims priority, application Japan, Jun. 7, 1985, 60-86148
Int. Cl.[4] H01R *4/66*
U.S. Cl. 339—14 R **14 Claims**



1. A connector socket comprising:

an insulating body having an annular recessed groove formed therein to extend from a front surface toward a rear surface of said body, a plurality of female contact accommodating holes formed in a cylindrical column portion surrounded by said annular recessed groove, to extend from the front surface toward the rear surface, and a main positioning recessed groove and an auxiliary positioning recessed groove formed in a circumferential surface of said cylindrical column portion;

a terminal board made of an insulation material attached to one side surface of said insulating body and having a plurality of guide slots for terminal positioning formed to extend in a direction perpendicular to the extending direction of said female contact accommodating holes;

a plurality of female contacts respectively accommodated in said female contact accommodating holes and having bent portions extending at right angles to form terminals behind the rear surface of said insulating body, said terminals being inserted, for positioning, into corresponding said guide slots of said terminal board;

an annular contact concentrically inserted into said annular recessed groove of said insulating body and having first earth terminal means protruded from the rear surface of said insulating body; and

a shield cover electrically and mechanically connected to said first earth terminal means, for covering the side surfaces of said insulating body except for the side of said terminal board, said shield cover having second earth terminal means extending on both sides of said terminal board beyond the surface of said terminal board.

4,637,670

DUAL IN-LINE PACKAGE CARRIER ASSEMBLY

James R. Coller; Paul A. Coon, and Joseph R. Goodman, all of Kernersville, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 23, 1984, Ser. No. 602,879
Int. Cl.[4] H01R *13/635*
U.S. Cl. 339—46 **5 Claims**

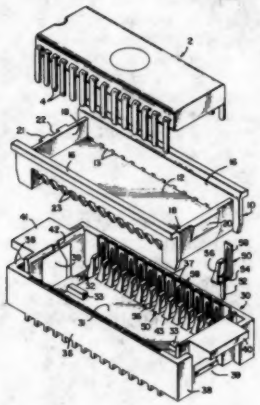
1. A dual in-line package carrier assembly comprising:

a carrier for assembling a dual in-line package thereto, said

carrier having a support surface, an opposed bottom surface, and opposed open surface means for assembling the leads of said package thereagainst, said open surface means lying between said support surface and said bottom surface,

a socket for mounting to a printed circuit board and for receiving said carrier therein, said socket having a floor and an opposed bottom surface, said floor having opposed upstanding sidewalls, a row of apertures spaced as said package leads in the floor adjacent each said sidewall,

a row of terminals mounted adjacent each sidewall in the socket, each terminal having a lead portion extending through a respective aperture for contact with the printed circuit board, a shoulder portion bearing against said floor, and a resilient contact portion extending obliquely of said floor, said contact portions in one row converging toward the contact portions in the other row as the



contact portions approach the socket floor, said contact portions being spaced to contact respective package leads disposed against said open surface means and to deflect resiliently toward the adjacent sidewall when said carrier is received in said socket, said resilient contact portions urging said carrier out when said carrier is received in said socket,

aligning means effective between said carrier and said socket to assure proper alignment between said package leads and the contact portions of said terminals,

releasable retaining means effective between said carrier and said socket for retaining said carrier in a first latched position when the carrier is fully received in said socket, and for releasing said carrier to a second unlatched position, said resilient contact portions forcing said carrier from the first latched position to the second unlatched position upon release of said retaining means.

4,637,671

THEFT-RESISTANT DEVICE FOR FLUORESCENT LAMP

George E. Johnson, Bronxville, and Walter Newman, Bayside, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Oct. 28, 1985, Ser. No. 790,661

Int. Cl.[4] H01R *33/08, 33/97, 13/62*

U.S. Cl. 339—50 R **6 Claims**

1. A locking system for a U-type tube of a flourescent lamp, comprising, in combination, said U-tube having opposed connecting and free ends, said connecting end having two pairs of male electrical contacts,

said U-tube includes two parallel tube portions and a coupling member at said connecting end adapted to hold said two tube portions in non-movable alignment,

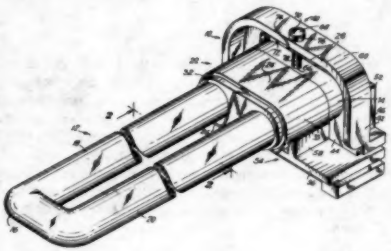
body means connected to a surface, said body means being for mounting said U-tube at said connecting end and for providing two pairs of female electrical contacts adapted to directly receive said male contacts, said body means also being for providing electrical contacts between said female contacts and a source of electrical power,

wherein said mounting body includes a body wall, said U-tube being generally transverse to said body wall, said body wall forming the said two pairs of female electrical receptacles adapted to receive said two pairs of said male members in electrical contact,

said coupling members having a first and a second opposed cross-wall, said cross-walls being disposed across said two U-tube portions in planes generally transverse to said body wall,

locking means connected to said body means for removably securing said connecting end of said U-tube into pressing contact with said body means;

support means connected to said body means for providing support for said U-tube in a direction opposed to the pressing contact exerted by said locking means; whereby



the U-tube cannot easily be removed from its mounted relationship with the body means,

said mounting body includes a flange extending from a portion of said body wall, generally perpendicularly from said body wall, towards said coupling member, spaced from the first cross-wall of said coupling member, said flange forming a hole having internal threads and having an axis generally parallel to the body wall and generally transverse to said first cross-wall, and

said locking means is an elongated screw member having external threads adapted to mate with said internal threads of said hole, said screw member extending through said hole generally transverse to said first cross-wall, said screw member having opposed contact and head ends, said contact end being in pressing contact with said first cross-wall,

said support means comprising a support member extending generally laterally from a portion of said body wall towards said coupling member, spaced from and opposite to said flange, to a position in which a portion of itself is in support contact with said second cross-wall of the coupling member, whereby said support member provides resistance to said screw member.

4,637,672

RADIOTRANSPARENT LEAD ASSEMBLY FOR MONITORING ELECTRODES

Stanley Peterman; Charles W. Orrestad, and Paul Iwanczuk, all of King County, Wash., assignors to Quinton Instrument Company, Seattle, Wash.

Filed Jun. 28, 1984, Ser. No. 626,374

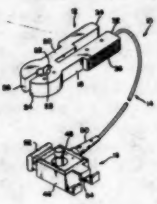
Int. Cl.[4] H01R *11/24, 4/02;* **A61B** *5/04*

U.S. Cl. 339—61 R **12 Claims**

1. A radiotransparent lead assembly for use with diagnostic

equipment and monitoring electrodes including electrically conductive elements thereon, comprising:

a molded, substantially non-metallic radiotransparent electrode clip having two opposing members, each of said members having a first end and a second end, the first end of one of said members provided with an electrical contacting element for contacting with the electrically conductive element of the monitoring electrode, said members connected by a flexible bridge, said members extending generally perpendicular to the axis of the electrically conductive element of the monitoring electrode, said second ends being manually operable to separate said first ends for electrical attachment to the monitoring electrode;



connector means for electrically connecting the electrode clip to the diagnostic equipment; and

a flexible, radiotransparent insulated conductor substantially extending between said contacting element and said connector means for transmitting bioelectric signals therebetween.

4,637,673

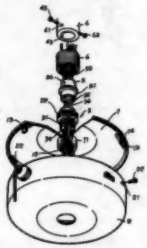
EASILY DISASSEMBLABLE SEPARATE CEILING FAN SWITCH BOX STRUCTURE AND AN ELECTRICAL CONNECTOR THEREFOR

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Aug. 13, 1985, Ser. No. 765,120

Int. Cl.[4] H01R *13/623*

U.S. Cl. 339—89 M **1 Claim**



1. A disassemblable ceiling fan switch box structure of the type for housing therein electrical components of a ceiling fan having electrical wires, in combination, comprising:

an upper cover, the center of which has an inwardly extending flange, and further having a through screw hole formed in the center of said flange;

two or more positioning plates positioned on the inner circumference of said upper cover, each of said positioning plates having a screw hole formed therein;

a lower housing body for receiving therein the electrical components and the electrical wires thereof, said lower housing body having two or more positioning holes formed therein corresponding to the positioning plates;

a first hollow distribution receptacle being substantially cylindrical in shape, having a middle section of enlarged diameter and defining therebelow a lower section of reduced diameter, said middle section and said lower section being threaded on the outer surface thereof;

insulation disposed in said first receptacle;

a second hollow distribution receptacle being substantially cylindrical in shape, and having a middle section of enlarged diameter, said second receptacle having a screw hole formed therein;

insulation disposed in said second receptacle;

a hollow fixing sleeve ring being substantially cylindrical in shape, said sleeve ring being threaded on the inner surface thereof and having an upper end of reduced internal diameter;

said second receptacle being received in the fixing sleeve ring, whereby the middle section of the second receptacle abuts the upper end of the fixing sleeve ring;

said first receptacle being received in the fixing sleeve ring, whereby the middle section of the first receptacle threadily engages the interior of the fixing sleeve ring;

said first receptacle being received in and threadily engaging the screw hole of the upper cover;

whereby the wires of the electrical components are disposed within the screw hole, first receptacle, and second receptacle respectively.

4,637,674

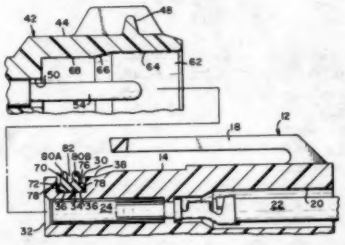
ANNULAR CONNECTOR SEAL

Robert J. Kobler, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 17, 1985, Ser. No. 735,889

Int. Cl.[4] H01R *4/00*

U.S. Cl. 339—94 M **10 Claims**



1. An assembly of a component and an annular sealing member comprising:

a cylindrical component including a plug section having a peripheral surface, said peripheral surface having an annular groove therearound having a preselected axial dimension and a substantially flat coaxial bottom surface having a preselected diameter; and

an annular sealing member comprising a ring-like article molded from a relatively incompressible elastomeric composition, said article having an axially extending body section, a coaxial substantially flat inner surface, a general outer surface substantially parallel to said inner surface, opposing front and rear surfaces, and at least one elastically deformable annular rib extending radially outwardly from said general outer surface of said body section, said body section having an axial dimension less than said preselected axial dimension of said annular groove, and said inner surface having a diameter approximately equal to said preselected diameter of said bottom surface of said annular groove;

said annular sealing member being seated in said annular groove of said component such that said inner surface of said body section is adjacent said bottom groove surface, said general outer surface is disposed within said annular groove, and said at least one annular rib extends radially outwardly beyond said periphral surface of said component, whereby when said plug section of said component with said annular sealing member thereon is axially inserted into a corresponding sleeve-like portion of a mating component, said at least one annular rib is engageable by an inner surface of said sleeve-like portion and is deformably urged axially rearwardly and inwardly thereby, and thereby capable of forming an annular sealing engagement between said inner surface of said sleeve-like portion of said mating component and said plug section of said component.

4,637,675

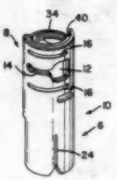
INSULATION DISPLACING BARREL TERMINAL

Winfield W. Loose, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 672,554, Nov. 19, 1984. This application Dec. 19, 1985, Ser. No. 810,800

Int. Cl.[4] H01R *4/24*

U.S. Cl. 339—97 R **8 Claims**



1. A wire-in-slot connecting device of the type comprising a sheet metal tubular body rolled from a flat sheet metal blank, wire admitting opening means in the tubular body proximate to one end thereof and a wire receiving and contacting slot means extending from the opening means partially around the circumference of the body, the connecting device being characterized in that;

the tubular body is of double thickness material around at least a portion of its circumference and comprises an inner layer and an outer layer,

the wire admitting opening means comprises a first opening in the outer layer and a second opening in the inner layer, the wire receiving slot means comprising a first slot in the outer layer and a second slot in the inner layer, the first and second openings and the first and second slots being in substantial registry whereby, a wire in the wire receiving slot means is contacted by the edges of the first slow and the edges of the second slot.

4,637,676

TERMINAL BLOCK MARKING SURFACE

Glenn H. Simonsen, Brookfield, and Clayton J. Klotz, Waukesha, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed May 13, 1985, Ser. No. 733,107

Int. Cl.[4] H01R *9/26*

U.S. Cl. 339—113 R **2 Claims**

1. A molded terminal block arranged for mounting on a supporting track and including;

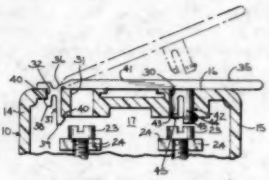
a base portion having means for detachably engaging said track,

an upstanding barrier wall having molded thereon and laterally extending therefrom an apertured ledge portion, a pedestal spaced from said ledge portion and oppositely disposed sidewalls, each cooperating to define a recessed area therebetween;

a wire terminal unit disposed in said recessed area and supported by said pedestal;

clamping screws threadingly engaging said terminal unit and having a portion extending into said recessed area, said screws being accessed for adjustment by means of substantially axially aligned ledge apertures;

a remaining ledge aperture providing identifying orientation means for positioning said terminal block relative to said track; and



an elongated marking strip having an exposed marking surface and overlaying said apertured ledge portion to cover the screw-aligning apertures, one end of said marking strip being provided with a retainer portion insertable in and retained by the said remaining aperture and having the free end thereof releasably engageable with one of the screw-aligning ledge apertures, said marking strip further including an area of reduced cross section intermediate the ends thereof, said area defining an integrally formed hinge therein.

4,637,677

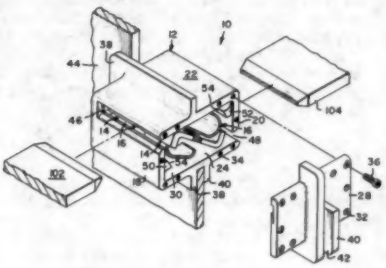
ELECTRICAL CONNECTOR

Lee A. Barkus, Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1984, Ser. No. 683,082

Int. Cl.[4] H01R *4/52*

U.S. Cl. 339—274 **16 Claims**



1. An electrical connector, comprising:

a housing with a cavity therein and with a slot located in each of two opposing walls providing access to the cavity, one slot being parallel to and adjacent a top wall of the housing and the second slot being parallel to and adjacent a bottom wall of the housing;

an elongated conductor having a convex surface at each end with one convex surface facing a direction opposite to that of the other convex surface; and

a spring member attached to the conductor intermediate the ends thereof and having a spring blade with a convex surface extending from opposite surfaces of the conductor;

said conductor and attached spring member being positioned

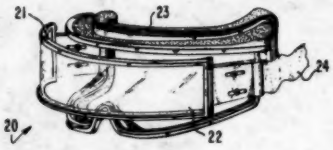
in the cavity so that the convex surface on each end of the conductor and on each spring blade are in line with a slot and are adjacent respectively a top and bottom wall to form therewith first and second receptacles in line with each other for receiving a tab inserted into the slots and further with the spring blades bearing against said top or bottom walls to resiliently position and support the conductor and permit pivoting thereof about the point of attachment as said tabs engage said first receptacles.

4,637,678

HOLOGRAPHIC LASER PROTECTION DEVICE

Gaylord E. Moss, Marina Del Rey; Mao-Jin Chern, Rancho Palos Verdes, and Teena L. Dobbs, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 1, 1982, Ser. No. 384,134
Int. Cl.[4] G02B *5/32*
U.S. Cl. 350—3.7 **12 Claims**



1. A holographic reflector for reflecting laser radiation at a predetermined wavelength which is incident over a predetermined angular range, said reflector comprising:

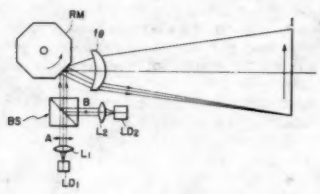
a plurality of holograms conterminously and adjacently disposed on at least one substrate, each of said holograms having holographic fringes with predetermined spacing which make a predetermined angle with respect to the normal to the surface of said substrate, each of said holograms having fringe spacings which are different from the fringe spacing of a hologram adapted to optimally reflect said predetermined wavelength, each of said plurality of holograms having fringe spacings and predetermined angles which are adapted to reflect said predetermined wavelength over separate angular ranges which are different from an angular range associated with a hologram adapted to optimally reflect said predetermined wavelength, said fringe spacings and predetermined angles being such that each of said holograms reflects said predetermined wavelength within said predetermined angular ranges which together comprise said predetermined angular range.

4,637,679

MULTIBEAM PHOTOSCANNER

Hiroyoshi Funato, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 12, 1983, Ser. No. 513,091
Claims priority, application Japan, Jul. 14, 1982, 57-121237
Int. Cl.[4] G02B *26/10, 27/10*
U.S. Cl. 350—6.5 **4 Claims**



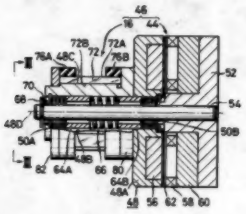
1. A multibeam photoscanner which comprises a laser light source, a laser beam deflector for deflecting and scanning beams from said light source, and a focusing optical system for focusing the deflected beams on a scanning surface, characterized in that said light source comprises a plurality of light sources wherein polarizing directions are different and an angle of incidence upon said deflector is slightly different, and the beams from said plurality of light sources are combined by means of a polarization beam combiner to simultaneously scan a plurality of different scanning lines in one and the same image plane.

4,637,680

BEAM CONVERTER IN OPTICAL MEASURING INSTRUMENT

Yoshiharu Kuwabara, Machida, and Hiroyoshi Hamada, Yokohama, both of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,565
Claims priority, application Japan, Jun. 24, 1983, 58-98433[U]
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **12 Claims**



1. A ray beam converter having a rotary mirror driven by a motor, for reflecting ray beams to convert the same into rotary scanning ray beams in an optical measuring instrument wherein said ray beams from a beam generator are converted into said rotary scanning ray beams to be scanned in one direction and dimensions of a workpiece to be measured are measured by the utilization of said rotary scanning ray beams, characterized in that a rotor of said motor is rotatably supported by bearings at a plurality of positions in a direction of the rotary axis of said motor, said rotary mirror is integrally formed on said rotor at a portion of said rotor supported by at least two bearings adjacent to each other, and said rotor is rotatably coupled to a spindle affixed to a stator of said motor through said bearings, said spindle being provided with a tubular portion to be coupled to a portion of the spindle protruding from a main body of the rotor, and said rotary mirror is integrally formed on said tubular portion.

4,637,681

OPTICAL PLANE CIRCUIT WITH AN OPTICAL COUPLER AND A METHOD FOR MANUFACTURING THE SAME

Noboru Yamamoto, and Tetsuya Yamasaki, both of Hyogo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 382,965, May 28, 1982. This application Jan. 30, 1985, Ser. No. 696,314
Claims priority, application Japan, Jun. 1, 1981, 56-82522
Int. Cl.[4] G02B *6/10*; H01L *21/306*; C23F *1/00*
U.S. Cl. 350—96.12 **32 Claims**

1. An optical plane circuit with an optical coupler, comprising:

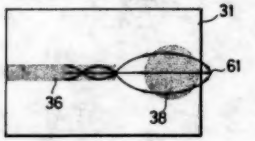
a transparent substrate having a front surface and a rear surface;

an optical waveguide formed by diffusion in said transparent substrate; and

a graded index type lens formed by diffusion in said transparent substrate adjacent to one end of said optical waveguide and serving as said optical coupler for improving the input and/or output efficiency of a light beam in and/or from said optical waveguide wherein the width of said optical waveguide as viewed from said front surface is smaller than the length of said graded index type lens measured in the same direction as said width of said optical waveguide; wherein the maximum thickness of said graded index type lens in the direction perpendicular to said front surface is larger than that of said optical waveguide in said perpendicular direction; wherein said graded index type lens has a varying refractive index in said direction perpendicular to said front surface; and further wherein said optical waveguide and said graded index type lens are buried inside said transparent substrate so as not to be exposed to said front surface thereof.

30. A method for manufacturing an optical plane circuit with an optical coupler, comprising the steps of:

forming, on a surface of a transparent substrate, a first diffusion mask layer of a predetermined pattern having a band-shaped aperture and a block-shaped hole formed at least adjacent to one end of said band-shaped aperture;



diffusing a first diffusion source, which increases a refractive index of said transparent substrate, in said transparent substrate through said first diffusion mask layer,

removing said first diffusion mask layer from said transparent substrate;

forming a second mask layer on said surface of said transparent substrate; and

diffusing a second diffusion source, which decreases the refractive index of said transparent substrate, into a shallow region of said transparent substrate, whereby in said transparent substrate are formed an optical waveguide corresponding to said region in which said first diffusion source is diffused through said band-shaped aperture and being buried below said surface of said transparent substrate, and a graded index type lens corresponding to said region in which said first diffusion source is diffused through said block-shaped hole, being buried below said surface of said transparent substrate, and serving as said optical coupler for improving an input and/or output efficiency of a light beam in and/or from said optical waveguide.

4,637,682

BRANCH CONNECTOR FOR LIGHT WAVEGUIDES

Hans F. Mahlein; Achim Reichelt, both of Unterhaching, and Gerhard Winzer, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

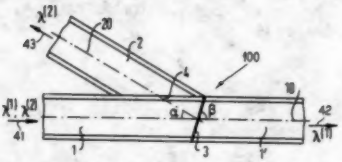
Filed Mar. 20, 1981, Ser. No. 246,100

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1980, 3012184

Int. Cl.⁴ G02B *6/26, 6/42*

U.S. Cl. 350—96.15 **6 Claims**

1. In a branch connector for light waveguides utilizing a beam divider principle, said connector comprising means aligning a pair of light waveguides on a common axis, a beam divider mirror being arranged on a plane slanted to the common axis and extending between the ends of the waveguides which are flush therewith, said beam divider mirror reflecting a beam traveling parallel to the common axis along a given direction, and means mounting at least one additional waveguide adjacent one of the pair of aligned waveguides on a second axis extending at an angle α to the common axis and intersecting said common axis at the beam divider mirror, said second axis being oriented to lie in said given direction so that the additional waveguide receives the reflected beam from the beam divider mirror, the improvements comprising means for reducing polarization effects without using lenses, said means for reducing consisting of the beam divider mirror being inclined towards the common axis at an angle β, said angle β being larger than 45° and satisfying the condition $\beta < 90° - \arcsin(A_N/n_0)$, wherein A_N signifies the numerical aperture of the light waveguide and n_0 is the index of refraction on the axis of the light waveguide, said angle α being less than 90° and the additional light waveguide having an end face lying in a plane extending at the angle α to the second axis and parallel to the common axis, said end face contacting one of the waveguides of the pair, said waveguides of the pair of waveguides being core-cladded glass fibers with a portion of the cladding of the one waveguide at the location of contact by the end face of the additional waveguide being removed to provide a planer surface for the end face to engage.



4,637,683

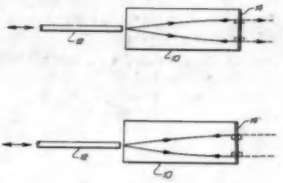
METHOD FOR ALIGNING OPTICAL FIBER CONNECTORS

Charles K. Asawa, Pacific Palisades, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 28, 1985, Ser. No. 695,516

Int. Cl.⁴ G02B *6/32*

U.S. Cl. 350—96.18 **10 Claims**



1. A method for angular alignment of each a plurality of lens-type optical fiber connectors without the use of a precision-made standard component each connector having a lens at one end for mating with the corresponding lens of another connector, the method comprising performing the following steps for each lens;

securing each lens in a holder with one of its end faces exposed;

forming a common reference plane without regard to the precise orientation of the lens, by grinding and polishing the exposed end face of the lens together with the adjacent surface of the holder; and

positioning an optical fiber at the other end face of the lens in such a manner that light rays from the fiber have a perpendicular angle of incidence on the reference plane;

whereby any two connectors will be perfectly angularly

aligned if their reference planes are butted together or placed in a parallel relationship.

4,637,684

METHOD OF MAKING AN OPTICAL COUPLER DEVICE UTILIZING VOLATILE LIQUID TO ACHIEVE OPTICAL CONTACT

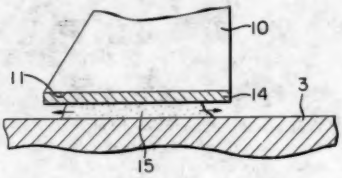
Yasuo Tomita, Yokohama; Shigetaro Ogura, Musashino, and Kazuya Matsumoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 401,249, Jul. 23, 1982. This application Feb. 14, 1985, Ser. No. 701,653

Claims priority, application Japan, Jul. 31, 1981, 56-119155

Int. Cl.[4] G02B *6/34;* C03B *35/00*

U.S. Cl. 350—96.19 7 Claims



1. A method for the manufacture of an optical coupler device comprising the steps of:

forming on a surface of a coupler for coupling a light beam to a wavegude and which coupler is to be joined to said waveguide, a thin film layer optically flat to within a quarter wavelength variation and having a refractive index lower than the refractive indices of said waveguide and said coupler;

joining the optically flat surface of said thin film layer formed on said surface of said coupler to a surface of said waveguide which is also optically flat to within a quarter wavelength variation through a thin film of volatile liquid; and

completely evaporating said volatile liquid to bring the joined surface of said thin film layer into optical contact with said waveguide.

4,637,685

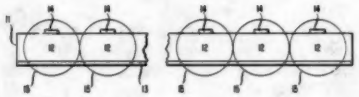
HIGH POWER, BROAD AREA, MONOCHROMATIC LIGHT SOURCE

Eugene I. Gordon, Convent Station, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1983, Ser. No. 511,848

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 7 Claims



5. A light source comprising a plurality of semiconductive chips, each chip including a plurality of injection lasers arranged in a linear array, each laser emitting at substantially the same wavelength, all of said lasers emitting light at essentially the same time, a plurality of ribbon cables each having coupling portions at one end, each cable including a plurality of optical fibers in a linear array, each chip being butt coupled to a ribbon cable with one laser being coupled to one optical fiber, the chip and the coupling portions of the ribbon cable being assembled in a unitary package and the other ends of the ribbon cables being arranged to form a two-dimensional array of fibers each emitting light of substantially said same wavelength at its end.

4,637,686

OPTICAL FIBER WITH LIGHT REFLECTING PARTICLES DISPERSED THROUGH BUFFER LAYERS TO DISSIPATE LEAKY CLADDING MODES

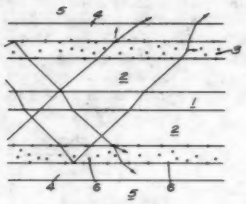
Yoshinao Iwamoto, Fujimi; Yuichi Shirasaki, Tokyo; Masayuki Fujise, Ebina, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1984, Ser. No. 597,666

Claims priority, application Japan, Apr. 8, 1983, 58-60798

Int. Cl.[4] G02B *6/02, 6/16;* F21V *7/04*

U.S. Cl. 350—96.29 5 Claims



3. An optical fiber structure comprising a central optical core surrounded by cladding, primary buffer and secondary buffer layers in that order, and wherein a particulate light reflecting material is uniformly dispersed along the boundary between and formed by the primary and secondary buffer layers to form nuclei which dissipates light leaking out of the cladding layer.

4,637,687

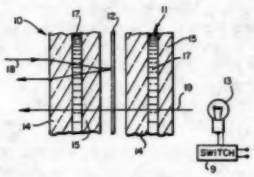
CASCADED, DUAL CELL TRANSFLECTIVE LIQUID CRYSTAL DISPLAY

Elias S. Haim, Windham, N.H., and Richard Albert, Seymour, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,648

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—335 6 Claims



1. A transflective liquid crystal display system comprising:

a. A pair of liquid crystal cells of the guest-host variety, each including a liquid crystal host; an optically active material and one or more dichroic dyes for absorbing the light in the unenergized background portion,

b. each of said cell cells having display elements of the same configuration which when energized permit passage of light, said cells being positioned to align all display elements and background portions on both cells,

c. a transflective member positioned between said cells for reflecting light passing through the front cell, back through front cell in the reflective mode, and transmitting light through both the front and rear cells in the transmis-

sive mode said rear cell having a greater spacing and thickness of solution than said front cell whereby light absorption therein and the contrast ratio of the assembly is greater in the transmissive mode than in the reflective mode,

d. a light source positioned behind the rear cell and the transflective element and energized during the transmissive mode whereby the light path through the two cells in the transmissive mode is at least as high as the light path through one cell in the reflective mode to maintain the contrast ratio in both operational modes,

e. means for simultaneously energizing both cells in the transmissive mode.

4,637,688

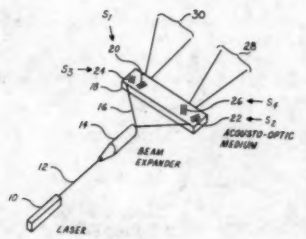
ACOUSTO-OPTIC DIFFRACTION AND SIGNAL MIXING DEVICE

Irwin J. Abramovitz; Norman J. Berg, both of Baltimore, Md., and Michael W. Casseday, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1984, Ser. No. 599,309

Int. Cl.[4] G02F *1/33*

U.S. Cl. 350—358 **6 Claims**



1. An acousto-optic apparatus for providing the products of a first signal with a second signal, and a third signal with a fourth signal, comprising:

a. means for producing a laser light beam;

b. means for expanding said laser light beam;

c. means for forming said expanded laser light beam into a sheet beam;

d. an acousto-optic medium having an axis and a planar surface extending between opposite first and second ends, said medium is disposed in the path of said sheet beam such that the sheet beam traverses the medium between the medium ends along and parallel to the medium surface;

e. a first acoustic transducer, disposed at the first end of the acousto-optic medium and supplied with a first signal, for propagating the first signal on the medium surface in the direction of the second end of the acousto-optic medium;

f. a second acoustic transducer, disposed at the second end of the acousto-optic medium and supplied with a second signal, for propagating the second signal on the medium surface in the direction of the first end of the acousto-optic;

g. a third acoustic transducer, disposed at the first end of the acousto-optic medium and supplied with a third signal for propagating the third signal on the medium surface in the direction of the second end of the acousto-optic medium;

h. a fourth acoustic transducer, disposed at the second end of the acousto-optic medium and supplied with a fourth signal, for propagating the fourth signal on the medium surface in the direction of the first end of the acousto-optic medium;

i. wherein said first and second signals diffract said sheet beam to produce a first beam containing the product of said first signal with said second signal; and

j. wherein said third and fourth signals diffract said sheet beam to produce a second beam containing the product of said third signal with said fourth signal.

4,637,689

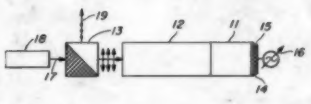
ACOUSTICALLY RESONANT TUNABLE ACOUSTO-OPTIC FILTER

I-Cheng Chang, Sunnyvale, Calif., assignor to Itek Corporation, Beverly Hills, Calif.

Continuation of Ser. No. 482,649, Apr. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 158,663, Jun. 12, 1980, abandoned. This application Apr. 8, 1986, Ser. No. 849,561

Int. Cl.[4] G02F *1/11*; G02B *5/30*

U.S. Cl. 350—372 **11 Claims**



1. A tunable acousto-optic filter having a birefringent acousto-optic crystal and, optionally, acoustic prism means for coupling a light beam along a predetermined axis through said birefringent crystal, said crystal and said optional prism coupler forming an acoustic resonator;

means for separating the light beam entering said crystal from the filtered light beam exiting said crystal;

acoustic drive means for exciting a standing acoustic wave in said filter;

means for varying the discrete resonant acoustic frequencies of said standing acoustic wave;

means to vary the frequency of said acoustic drive means to vary the center wavelength of the optical filter passband;

means for reducing the effective finesse of said filter to a value of less than 0.5, thereby to reduce ripples in the tuning bandpass response of said filter;

the said effective finesse, F, of said filter being given by the relation,

$$F=(l/d)(1+4\cot^2\theta_i)^{-\frac{1}{2}}$$

wherein "l" is the acousto-optic interaction length for the light beam,

"d" is the acoustic path length of the acoustic resonator, and "θ_i" is the polar angle of the light beam incidence.

4,637,690

TELECENTRIC ZOOM LENS SYSTEM

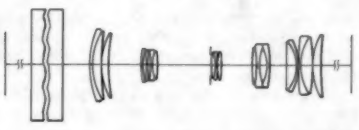
Hiroshi Miyamae, Koganei, and Makoto Banno, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,646

Claims priority, application Japan, Apr. 6, 1981, 56-50514; Apr. 14, 1981, 56-55038

Int. Cl.[4] G02B *15/16*

U.S. Cl. 350—427 **10 Claims**



1. A telecentric zoom lens system comprising at least one movable lens group arranged on a rear side of an iris, said movable lens group being movable along an optical axis thereof according to variation of magnification, means for maintaining the position of said iris near the front focal point of

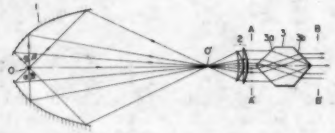
a partial lens system consisting of all lens elements arranged on said rear side corresponding to the movement of said movable lens group during variation of magnification, whereby a telecentric condition is always obtained.

4,637,691

MIRROR CONVERGING-TYPE ILLUMINATION OPTICAL SYSTEM

Makoto Uehara, Tokyo, and Sumio Hashimoto, Kawasaki, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,477
Claims priority, application Japan, Feb. 7, 1983, 58-18697
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] G02B *21/06*
U.S. Cl. 350—432 **9 Claims**



1. An illumination optical system for supplying substantially uniform illumination light of a high efficiency, comprising:

a light source;

light-ray converting means for converting light rays from said light source into parallel light rays, said light-ray converting means having a concave reflecting surface which has an optical axis; and

a refraction member arranged in a path of the parallel light rays, so that said refraction member shifts the incident parallel light rays which are farthest from the optical axis to positions substantially coinciding with the optical axis, and shifts the incident parallel light rays which are nearest to the optical axis to positions substantially farthest from the optical axis, said refraction member having a conical input surface having a convex surface facing toward an incident light ray side and a conical output surface having a convex surface facing toward an exit light ray side, vertices of said conical input and output surfaces being located on the optical axis.

4,637,692

OBSERVATION APPARATUS

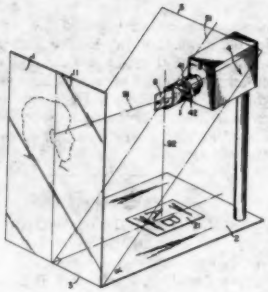
Jean-Michel Baluteau, Livry-Gargan; Michel Saint-Sevin, Gagny, and Patrick Chabanier, Vincennes, all of France, assignors to Societe d'Optique, Precision Electronique et Mecanique-Sopelem, Levallois-Perret, France

Filed May 7, 1984, Ser. No. 607,488
Claims priority, application France, May 11, 1983, 83 07936
Int. Cl.[4] G02B *26/08*
U.S. Cl. 350—486 **5 Claims**

1. In an apparatus provided with an unmoving observation device for alternate scanning of two objects respectively located in two intersecting planes to present on a vertical plane alternately one of two images thereof positioned in the same direction, whereby it is unnecessary to rotate one image, said device comprising a camera with an objective on a mirror rotatable in front of the camera objective, the improvement according to which:

(a) said camera is located in a bisector plane of a dihedron formed by two imaginary half planes corresponding to the planes of said two objects and forming an angle α therewith, the optical axis of said camera being oriented according to an angle β equal to $(\pi-\alpha)/2$ with a straight center line of said bisector plane perpendicular to the ridge of one of the half planes forming said dihedron;

(b) means for rotating said mirror located in front of the camera objective about an optical axis of said camera objective according to an angle γ such as



$$\tan\frac{\gamma}{2}=\frac{1}{\sin\frac{\alpha}{2}}$$

in order to reproduce alternately on said screen one of said two objects;

(c) said optical axis being so located that its angle of incidence (i) satisfies with said mirror the equation

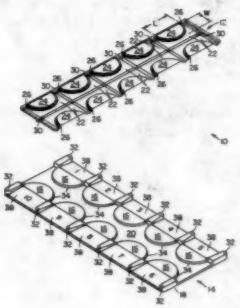
$$\cos 2i=\pm\sin^2\frac{\alpha}{2}.$$

4,637,693

MICROSCOPE INSPECTION SLIDE

Vance C. Mitchell, Irvine, Calif., assignor to ICL Scientific Corp., Fountain Valley, Calif.

Filed Jul. 23, 1985, Ser. No. 758,056
Int. Cl.[4] G01N *21/01*; G02B *21/34*
U.S. Cl. 350—536 **6 Claims**



1. A slide for use in the examination of liquid specimens, said slide comprising:

a base plate having at least one flat examination chamber floor surface, said examination chamber floor surface being raised above an upper deck surface of said base plate;

a cover plate having at least one flat examination chamber roof surface, said examination chamber roof surface being recessed from a lower surface of said cover plate and said examination roof surface having a smaller surface area over said examination chamber floor surface;

a depth control ridge extending away from said examination

chamber roof surface on all sides, but one, a sufficient distance to extend beyond the edge of said examination chamber floor surface so that positioning said examination chamber roof surface over said examination floor surface results in a fixed distance being determined by said depth control ridge between said examination chamber roof and floor surfaces, said depth control ridges having at least one notch extending between the examination chamber and the edge of said depth control ridge furthest from said examination chamber to provide for drainage onto said upper deck surface;

bonding means extending from said cover plate so that positioning said cover plate on said base plate and bonding said cover plate to said upper deck surface affixes said cover plate to said base plate and also forms an essentially continuous bond between said base plate and said cover plate about the perimeter of each examination chamber.

4,637,694

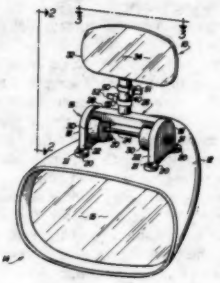
AUXILIARY REAR VIEW MIRROR ASSEMBLY AND OUTBOARD MIRROR

Albert A. Castaneda, 2752 SW. 24 Terrace, Miami, Fla. 33145

Filed Aug. 26, 1985, Ser. No. 769,523

Int. Cl.⁴ G02B *7/18, 5/08;* B60R *1/08*

U.S. Cl. 350—626 **9 Claims**



1. In combination, a rear view mirror assembly and an outboard mirror, said assembly being mounted to said outboard mirror and said outboard mirror being adapted to be installed on a vehicle, said outboard mirror including a casing having an upper surface,

said assembly comprising:

(a) base maans for supporting said mirror assembly to the upper surface of said casing of the outboard mirror,

(b) a support platform movably connected to said base means and rotatable about a substantially central axis thereof and including a connecting structure extending upwardly from said support platform and movable therewith,

(c) a mirror element including a mounting portion extending upwardly from said support platform, said mounting portion and said connecting structure movably connected to one another and cooperatively structured so as to move both rotatably and linearly relative to one another,

(d) locking means disposed in interconnected relation between said mounting portion and said connecting structure and structured to prevent relative movement therebetween,

(e) said central axis of rotation of said base means disposed in perpendicular relation to an axis of rotation of said mounting portion relative to said connecting structure, and

(f) said support platform, connecting structure and mounting portion cooperatively structured and disposed to allow substantial universal positioning of said mirror element relative to said base means.

4,637,695

ADJUSTING THE DIRECTION OF A BEAM OF RADIATION

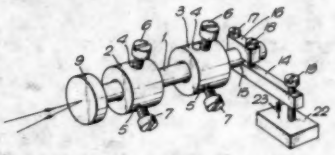
Charles V. Perkins, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 25, 1985, Ser. No. 748,524

Claims priority, application United Kingdom, Jun. 26, 1984, 8416263

Int. Cl.⁴ A47F *7/14;* G02B *26/08*

U.S. Cl. 350—631 **11 Claims**



6. An arrangement for adjusting the direction of a beam of radiation comprising

a shaft mounted in a bearing structure for rotational adjustment, said shaft being lightly loaded against said bearing structure prior to said adjustment; and

a mirror mounted on said shaft, said mirror having a normal inclined to a longitudinal axis of said shaft;

said shaft being rigidly secured in said bearing structure by an adhesive after said adjustment, said shaft being freed of loading against said bearing structure after said adhesive has set.

4,637,696

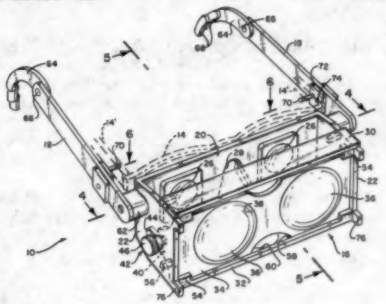
BINOCULAR EYEGLASSES FOR IMAGE MAGNIFICATION

Vaughn D. Wilkins, 19163 Olympia St., Northridge, Calif. 91326

Filed Dec. 16, 1985, Ser. No. 809,495

Int. Cl.⁴ G02C *7/08, 1/00*

U.S. Cl. 351—41 **10 Claims**



1. Binocular eyeglasses, comprising:

a rear frame panel having a pair of lens openings formed therein;

a pair of eyepiece lenses respectively covering said rear panel lens openings;

a pair of slide panels projecting forwardly from opposite ends of said rear panel;

means cooperating with said side panels to define a slide track extending in a fore-aft direction in front of said rear panel;

a front side panel having a pair of lens openings formed therein and received within said track for fore-aft sliding movement relative to said rear panel;

a pair of objective lenses covering said front panel lens openings, said track including means for maintaining said objective lenses in optical alignment with said eyepiece

lenses throughout fore-aft sliding movement of said front panel;

means forming front and rear limit stops defining front and rear end limits to fore-aft sliding movement of said front panel;

means for releasably locking said front panel against fore-aft sliding movement; and

a pair of bows connected respectively to outboard sides of said side panels and projecting rearwardly therefrom.

4,637,697

MULTIFOCAL CONTACT LENSES UTILIZING DIFFRACTION AND REFRACTION

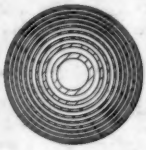
Michael H. Freeman, Wales, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Continuation-in-part of Ser. No. 533,993, Sep. 20, 1983, and a continuation-in-part of Ser. No. 368,362, Apr. 14, 1982. This application Oct. 19, 1983, Ser. No. 543,257

Claims priority, application United Kingdom, Oct. 27, 1982, 8230621

Int. Cl.⁴ G02C *7/04, 7/06;* G02B *3/08, 27/44*

U.S. Cl. 351—161 **22 Claims**



1. A bifocal contact lens dividing light passing through a common portion thereof and providing two foci for said light, a first portion of said light being focused by refraction and a second portion of said light being focused by asymmetric zone plate surfaces.

4,637,698

PHOTOCHROMIC COMPOUND AND ARTICLES CONTAINING THE SAME

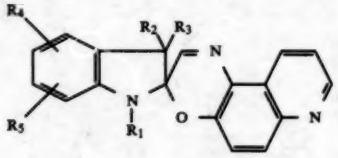
Won S. Kwak, Akron, and Rodney J. Hurditch, Doylestown, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 548,600, Nov. 4, 1983, abandoned. This application Jul. 30, 1984, Ser. No. 635,696

Int. Cl.⁴ G02B *5/23;* G02F *1/01*

U.S. Cl. 351—163 **25 Claims**

1. A photochromic compound represented by the following graphic formula:



wherein:

(a) R_1 is selected from the group consisting of C_1–C_8 alkyl, phenyl, phen(C_1–C_4)alkyl, allyl and mono- and disubstituted phenyl, said phenyl substituents being selected from C_1–C_4 alkyl and C_1–C_5 alkoxy;

(b) R_2 and R_3 are each selected from the group consisting of C_1–C_5 alkyl, phenyl, C_1–C_4 alkyl and C_1–C_5 alkoxy mono- and disubstituted phenyl, benzyl or combine to form a cyclic ring selected from the group consisting of an alicyclic ring containing from 6 to 8 carbon atoms (including the spiro carbon atoms), norbornyl and adamantyl, and

(c) R_4 and R_5 are each selected from the group consisting of hydrogen, C_1–C_5 alkyl, halogen, C_1–C_5 alkoxy, nitro, cyano and C_1–C_8 alkoxycarbonyl.

4,637,699

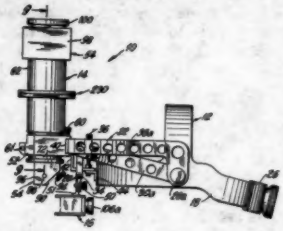
BINOCULAR OPHTHALMOSCOPE

Jesse Sigelman, 69 E. 71 St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 391,494, Jun. 24, 1982, Pat. No. 4,538,888. This application Sep. 12, 1984, Ser. No. 650,329

Int. Cl.⁴ A61B *3/10*

U.S. Cl. 351—205 **3 Claims**



1. A binocular ophthalmoscope, comprising:

an optical viewing system;

light source means having a light outlet for illuminating a patient's eye; and

headgear means mountable on an examiner's head during use for supporting the optical viewing system in optical alignment with the examiner's eyes and the light source means for the light outlet above the optical viewing system;

wherein the light source means includes selecting means for selectively providing both full beam and slit beam illumination of a patient's eye, a first condensing lens for focusing light on the selecting means, a second condensing lens for refocusing the light passing through the selecting means onto an aerial image of the retina, a third lens for shortening the focal length of the beam emitted from the light outlet and means mounting the third lens for pivotal movement into and out of the beam path.

4,637,700

METHOD AND AN APPARATUS FOR DETERMINING REFRACTION OF THE HUMAN EYE

Helmut Krueger, Henckystrasse 5, 8000 Munich 50, Fed. Rep. of Germany

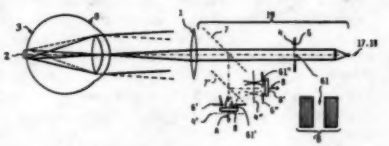
PCT No. PCT/DE83/00025, § 371 Date Oct. 7, 1983, § 102(e) Date Oct. 7, 1983, PCT Pub. No. WO83/02716, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 10, 1983, Ser. No. 552,053

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204876

Int. Cl.⁴ A61B *3/10*

U.S. Cl. 351—211 **12 Claims**



1. A method for determining the time dependent refraction of the human eye comprising the steps of:

imaging a target object having partial portions which extend in depth and offset from one another in the direction of the optical axis in an object space onto the retina of an eye with an optometer lense system so that the retinal image of

the object is re-imaged via said lense system into the object space and into an image plane which is conjugated with respect to the retina and depends on the refraction of the eye and the index of refraction of the lense system, the distance of the conjugated image plane from said lense system being a measure of refraction; and

simultaneously analyzing the image sharpness of the beam of rays from the retinal image at at least two different distances from the conjugated image plane by at least first and second objects positioned in the object space and offset in the direction of the optical axis.

4,637,701

SHUTTER FOR USE IN A TELEVISION CAMERA

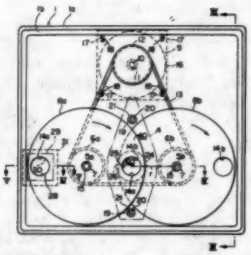
Yoshihisa Yamaguchi, Tokyo, Japan, assignor to Yamaguchi Cinema Corporation, Tokyo, Japan

Filed May 19, 1986, Ser. No. 865,187

Claims priority, application Japan, Jun. 18, 1985, 60-132407; Jun. 18, 1985, 60-92094; Jun. 18, 1985, 60-92095

Int. Cl.[4] G03B *9/10*

U.S. Cl. 352—218 **6 Claims**



1. A shutter for use in a television camera, comprising:

a casing having a first wall having a first opening formed therethrough for allowing incident light from a lens of the television camera to pass through the first opening and a second wall opposingly disposed to the first wall and having a second opening aligned to the first opening for allowing the incident light to pass through the second opening into a body of the television camera;

a first disc member supported within the casing to be rotatable about an axis thereof and in parallel with the first and the second walls, the first disc member having a first shutter hole formed therethrough;

a second disc member supported within the casing to be rotatable about an axis thereof and in parallel with the first and the second walls, the second disc member having a second shutter hole formed therethrough, the first disc member and the second disc member being disposed to overlap at overlapping areas at peripheries thereof with a gap, the first and second shutter holes formed to be aligned to each other and to the first and second openings at the overlapping areas to define a shutter opening when the first and second disc members rotate;

rotating means, mounted on the casing, for rotating the first and the second disc members in the same direction; and

controlling means for controlling the rotating means to thereby control the rotation of the first and the second disc members so that the forming of the shutter opening is synchronized with a field scanning of the television camera, whereby the incident light is allowed to pass through the first opening, the shutter opening and the second opening in synchronism with the field scanning of the television camera.

4,637,702

SAFETY APPARATUS FOR FEEDING A FILM OF A CAMERA

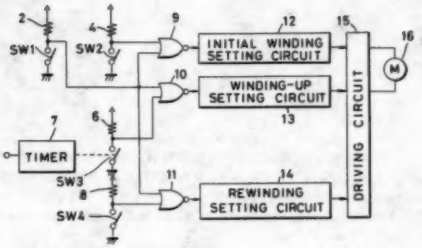
Kazuyuki Kazami, Tokyo, and Hiroshi Wakabayashi, Yokohama, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,460

Claims priority, application Japan, Oct. 11, 1984, 59-213128

Int. Cl.[4] G03B *1/12*

U.S. Cl. 354—173.11 **3 Claims**



1. A camera comprising:

shutter means which has a blade member and starts displacement of said blade member for opening an exposing aperture in response to a first electric signal and starts displacement of said blade member for closing said exposing aperture in response to a second electric signal;

film feeding means having an electric motor and means for driving said electric motor for feeding a film installed into said camera, said feeding of the film including initial winding for allowing the first frame of said film to face said aperture, winding-up for allowing the subsequent frame to face said aperture forevery exposure, and rewinding of the exposed film;

monitor means for monitoring the displacement of said blade member and generating a detection output when said aperture is open; and

means for inhibiting the initial winding, winding-up and rewinding of said film feeding means in response to the detection output of said monitor means.

4,637,703

FILM PACK

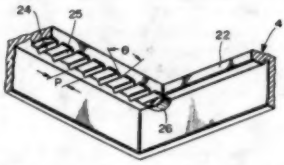
Minoru Ono, and Teruyoshi Makino, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 19, 1985, Ser. No. 766,964

Claims priority, application Japan, Aug. 17, 1984, 59-171173

Int. Cl.[4] B65D *85/67*; G03B *17/26*

U.S. Cl. 354—276 **10 Claims**



1. A film pack for containing and removably holding a plurality of instant film sheets, each of said instant film sheets having an emulsion layer on its one surface, said film pack comprising:

a parallelepipedal housing having a flat top wall having an exposure aperture therein;

a pressure plate contained in said housing for urging said instant film sheets against the inner surface of said flat top wall for exposure; and

means for preventing said emulsion surface from receiving

scratch marks, said means comprising a plurality of tapered projections arranged on a part of said housing with which said emulsion surface is in slidable contact when each said instant film sheet is withdrawn from said housing after exposure, said tapered projections have ridge lines extending in the direction of movement of said instant film sheets.

4,637,704

EXCHANGEABLE LENS WHICH EXCHANGES ELECTRICAL SIGNALS WITH A CAMERA BODY

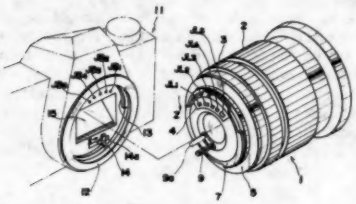
Toshihiko Ishimura, Habikino, and Yukio Maekawa, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,756

Claims priority, application Japan, Nov. 19, 1984, 59-175426[U]

Int. Cl.[4] G03B *17/12*

U.S. Cl. 354—286 8 Claims



1. An exchangeable lens for use with a camera provided with a plurality of terminals which are arranged in a circle, said lens comprising:

a lens barrel to be mounted on the camera body by the rotation thereof in a given direction;

a plurality of terminals fixed on said lens barrel and arranged circularly on said lens barrel concentric with the optical axis of said lens to be brought into mutual contact with corresponding terminals of said camera body respectively, said terminals on said lens barrel including a power supply terminal and a ground terminal through which electric power is supplied from said camera body, and signal terminals through which signals are exchanged between said lens and said camera body;

a CMOS circuit connected to said terminals of said lens and functioning to produce signals upon receiving electric power through said power supply terminal and ground terminal; and

each of said terminals on said lens barrel extending for contact along the direction of rotation of said lens barrel and having a contact commencing point which first comes into contact with a corresponding terminal of said camera body, during the rotation of said lens barrel attendant for the mounting thereof on said camera body, the locations of said contact commencing points of said terminals being such that said power supply terminal and said ground terminal come into contact with their corresponding terminals on said camera body in advance of said signal terminals.

4,637,705

AUTOMATIC FOCUSING CAMERA

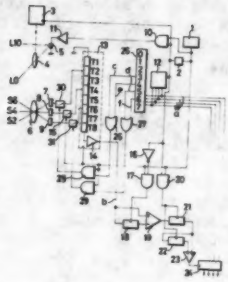
Takashi Kawabata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1985, Ser. No. 701,969

Claims priority, application Japan, Feb. 18, 1984, 59-29075

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—403 29 Claims



1. An automatic focusing camera comprising:

(a) light projecting means for projecting a signal light toward an object to be photographed;

(b) deflecting means for deflecting the projection of the signal light from said light projecting means to discrete directions successively;

(c) photosensitive means for receiving the reflection of said signal light from the object, said photosensitive means including a plurality of photosensitive elements positioned to receive the reflections from target points existing only in respective certain prescribed directions;

(d) focusing adjustment information forming means responsive to detection of an object distance information from the output states of said plurality of photosensitive elements related to the reflected position of the signal light by said deflecting means for forming a focusing adjustment information for a photographic lens; and

(e) selecting means for selecting those of said plurality of photosensitive elements which contribute to a formation of the focusing adjustment information depending upon the deflected position of said deflecting means so that the size of a distance measurable area within a picture frame is varied as a function of the distance.

4,637,706

DEVELOPER THIN LAYER FORMING APPARATUS

Atsushi Hosoi, Tokyo; Fumitaka Kan, Yokohama; Hidemi Egami, Zama; Hatsuo Tajima, Matsudo; Shunji Nakamura, and Kimio Nakahata, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,558

Claims priority, application Japan, Jun. 14, 1983, 58-104986; Jun. 14, 1983, 58-104987

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 DD 29 Claims

1. A developable apparatus, comprising:

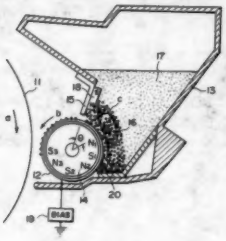
a developer supply container, having an opening, for containing a non-magnetic developer and magnetic particles;

an endlessly movable developer carrying member of a non-magnetic material for carrying a developer, which is movable between an inside of said developer supply container and an outside of said developer supply container through the opening;

a magnetic particle confining member, spaced from an outer surface of said developer carrying member with a gap;

means for generating a fixed magnetic field, having magnetic pole means disposed inside of said carrying member and

upstream of said confining member with respect to the movement direction of said developer carrying member; and



a magnet, disposed outside of said carrying member in proximity with said confining member at an upstream side thereof with respect to the movement direction of said developer carrying member.

4,637,707

SUPPLEMENTARY DATA COPYING METHOD AND ORIGINAL PICTURE IMAGE RECORDER HAVING SUPPLEMENTARY DATA DISPLAY MEANS

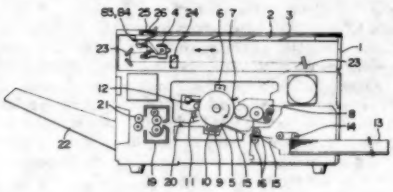
Seitaro Kasahara; Akira Sawaki, both of Hachioji, and Shun Kawata, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

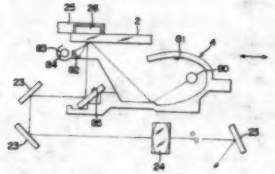
Filed Nov. 6, 1984, Ser. No. 668,731

Claims priority, application Japan, Dec. 28, 1983, 58-245243; Dec. 28, 1983, 58-245244; Dec. 28, 1983, 58-245245; Dec. 28, 1983, 58-245246; Dec. 28, 1983, 58-245247

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **9 Claims**





1. An original picture image recorder comprising a supplementary data display means for displaying supplemental data being copied in addition to original data, said display means being provided close to a document glass plate on which documents being recorded are mounted; an image forming assembly for exposing said documents and display means to light and forming electrostatic images corresponding to reflex light therefrom on an image retainer; a developing assembly for developing the electrostatic images into visible ones; and means for preventing the background area of said display means in a display state from generating photographic fog on materials being recorded.

4,637,708

ONE-COMPONENT COPIER TONER WITH ELECTRIC FIELD TRANSFER

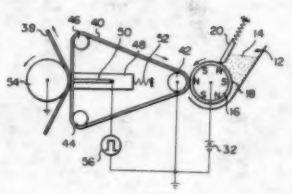
Kazuhiro Yuasa, Zama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,447

Claims priority, application Japan, Jul. 26, 1984, 59-156388; Jul. 26, 1984, 59-156389; Jul. 31, 1984, 59-158573

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **7 Claims**



1. A recording apparatus for recording image data on a recording medium by means of a one-component high-resistance toner, comprising:

a rotatable sleeve for transporting the toner which has been charged;

a movable endless conveyor belt for transporting the charged toner, which is transported thereto by the rotatable sleeve which is in contact with the belt, to the recording medium;

toner transfer means for developing an electric field directed from the rotatable sleeve toward the belt to transfer the toner from the sleeve to the belt; and

a multi-stylus head which has a number of electrodes in the form of styli which abut against the back of the belt which is opposite to the toner deposition surface of the belt, voltage pulses associated with the image data being applied to the styli.

4,637,709

APPARATUS FOR GENERATING AN IMAGE FROM WITHIN A SHEET-LIKE MEMBER

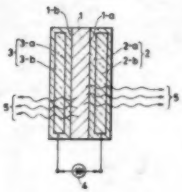
Masaharu Shirai, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,710

Claims priority, application Japan, Dec. 23, 1983, 58-242244; Dec. 23, 1983, 58-242246; Dec. 23, 1983, 58-242247

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **13 Claims**



1. A device for obtaining an image from at least one surface of a sheet-like member bearing characters by producing light within said member, said device comprising:

two confronting electrodes, at least one of said electrodes having an insulating layer thereon;

means for placing said member between said two electrodes

such that said member contacts said electrodes and said insulating layer on at least one of said electrodes;

means including said two electrodes for producing an image of at least one surface of the sheet-like member by inducing a corona discharge within the member, wherein said image is formed by light from said corona discharge attenuated by said characters; and

means for utilizing the image.

4,637,710

DRUM TYPE IMAGE SCANNING AND RECORDING APPARATUS

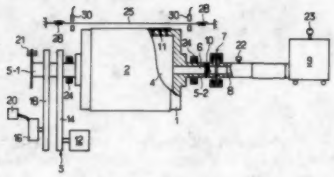
Teruo Fujii, and Tomikazu Tsutsui, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 19, 1985, Ser. No. 799,727

Claims priority, application Japan, Dec. 3, 1984, 59-256166

Int. Cl.[4] G03B *27/58*; H04N *1/08*

U.S. Cl. 355—72 **6 Claims**



1. A drum type image scanning and recording apparatus having a drum, around whose cylindrical external surface a film is fixedly wrapped, and a drum driving apparatus mechanically coupled to said drum for rotating the drum, the apparatus comprising:

a string tensionally stretched close to and along the external surface of said drum in parallel with the drum axis;

string stretching means for supporting said string tensionally;

swing detecting means for detecting the swing of said string produced when part of the film and said string are in contact with each other when said drum is rotating and the film separates away from the drum external surface; and

drum braking means for stopping rotation of the drum in accordance with said detection signal from said swing detecting means.

4,637,711

PROCESS FOR ROLLING A DRUM WITH A PHOTOSENSITIVE FILM

Kunio Fujisawa, Saitama; Toyoji Tanaka, Tokyo; Toshio Mochizuki, Saitama; Norio Nakamura, Saitama, and Seiji Kaya, Saitama, all of Japan, assignors to Fujirex Company, Ltd., Japan

Filed Nov. 14, 1985, Ser. No. 798,175

Claims priority, application Japan, Nov. 14, 1984, 59-240189

Int. Cl.[4] G03B *27/58*; H04N *1/08*

U.S. Cl. 355—72 **2 Claims**

1. A process for rolling a drum with a photosensitizer film, characterized in that the drum is rolled with a photosensitizer film by making the photosensitizer film tubular by uniting the seam-edge parts on both sides of the photosensitive film through a thermally contractible film and that the drum is rolled without any clearance with the photosensitive film by causing the thermally contractible film to contract by heating same.

4,637,712

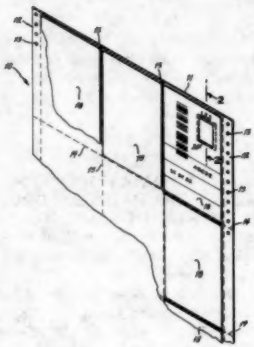
SYSTEM FOR PACKAGE PHOTOPRINTING

Marc E. Arnold, St. Louis, Mo., and Mitchell S. Marcus, Winnetka, Calif., assignors to Hasco International, Inc., St. Charles, Mo.

Filed Nov. 21, 1984, Ser. No. 673,599

Int. Cl.[4] G03B *27/62, 27/32*

U.S. Cl. 355—75 **11 Claims**



1. For producing an order for package photoprints in a photographic package printer subject to the control of a printer controller, the combination of

an order form and negative carrier having

a rectangular backing of waxed paper, a die-cut front sheet of paper characterized by capability to absorb printing ink and having, in contact with the waxed paper backing, a coating of an adhesive capable of retaining photographic film, the waxed backing and front sheet being scored with a larger frame opening in the backing and a smaller frame opening in the front sheet aligned in centered position relative to said larger frame opening,

the portions of said backing and front sheet within such frame opening scores being removed, whereby to provide a frame portion with a rearwardly presented adhesive frame margin,

a film negative mounted therein by said adhesive, and

an order ink-imprinted on said front sheet, outward of such frame portion, in both visually readable and bar-coded form, in combination with

feeder-reader apparatus for said negative carrier comprising

a loading station at a loading level and means to feed said negative carrier forwardly therefrom,

means to provide a negative carrier path including a downward-sloping path portion extending from said loading station to such package printer and having a first path gap at a level below such loading level,

a bar-code reader positioned along said downward sloping path at a level below that of said first path gap, for reading said negative carrier as it moves along such path, a rejected station at a level below said loading station and adjacent to and aft of said first path gap,

means along such path to retain said negative carrier in position, to advance it along such path, and to reverse its movement therealong, whereby should a reading by said bar-code reader be unacceptable, said negative carrier may be reversed for re-reading or for driving slopingly

upward along such path and aft through said first gap to said rejected station, and whereby if such reading is acceptable the negative carrier may be retained until such photographic package printer is unoccupied by any prior negative carrier,

said means to provide a path including a further path portion for feeding said negative carrier forward, at a lesser slope, into such photographic package printer, such further path portion being at a level spacedly below said downward-sloping path, whereby to establish a second gap therebetween,

a completed station adjacent to and aft of said second gap, and

means to advance such negative carrier along such further path portion and to withdraw it therealong, whereby on advancing to insert it into such photographic package printer, and on withdrawing to deliver such negative carrier through said second gap and to such completed station, said feeder-reader apparatus further having

microprocessor means to store such readings and to transmit them to such a printer-controller for controlling the operation of such a photographic package printer when such negative carrier has been so inserted therein.

4,637,713

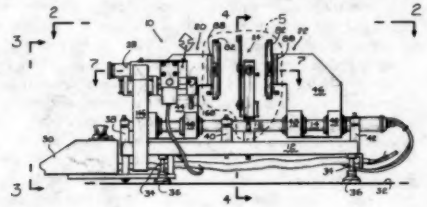
PELLICLE MOUNTING APPARATUS

Arthur M. Shulenberger, and John A. Piatt, both of Capitola, Calif., assignors to SCSS Instruments, Inc., Santa Cruz, Calif.

Filed Sep. 27, 1985, Ser. No. 781,227

Int. Cl.[4] G03B *27/62, 27/64;* G03F *9/00*

U.S. Cl. 355—76 **10 Claims**



1. A pellicle mounting apparatus for mounting a pellicle to a photomask, said apparatus comprising:

a base provided with a track;

a photomask holder assembly coupled to said base;

a first pellicle holder assembly coupled to said track on a first side of said photomask holder assembly;

a second pellicle holder assembly coupled to said track on a second side of said photomask holder assembly; and

drive means coupled between said first pellicle holder assembly and said second pellicle holder assembly, said drive means being adapted to drive said first pellicle holder assembly and said second pellicle holder assembly along said track towards and away from said photomask holder assembly.

4,637,714

INSPECTION SYSTEM FOR PELLICALIZED RETICLES

Alexander L. Flamholz, Monsey, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,599

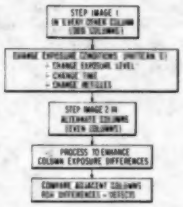
Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—77 **14 Claims**

1. A method of detecting defects in a step-and-repeat projection system for imaging patterns from a reticle subject to contamination onto a substrate comprising the steps of:

exposing a first site on said substrate coated with a photosensitive film to radiation through said reticle to achieve a first exposure condition;

exposing a second site on said substrate coated with said photosensitive film to radiation to achieve a second exposure condition; and



comparing by an optical comparator the first and second sites to identify the presence and location of defects by a difference in optical imagery existing at said first and second sites.

4,637,715

OPTICAL DISTANCE MEASURING APPARATUS

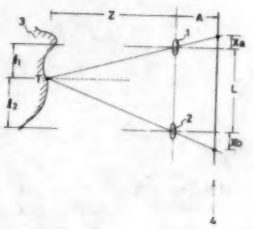
Masanori Idesawa, Saitama, Japan, assignor to Rikagaku Kenkyusho, Japan

Filed Aug. 17, 1984, Ser. No. 642,139

Claims priority, application Japan, Sep. 1, 1983, 58-161088

Int. Cl.[4] G01C *3/00;* G03B *3/00*

U.S. Cl. 356—1 **16 Claims**



1. An optical distance measuring apparatus comprising: a reflector and an observation lens put at such a position that a ray of light from any particular point on an object may fall directly on the observation lens to produce a first image of said point in an observation plane and that a ray of light from the particular point may fall on the observation lens after being reflected by the reflector to produce on said observation plane a second image of the particular point spaced apart from said first image, thus permitting determination of a distance from the observation lens to the particular point on the object according to the triangulation.

4,637,716

FIBER-OPTICAL DOPPLER ANEMOMETER

Helmut Auweter, Ludwigshafen; Dieter Horn, Heidelberg, and Erik Lueddecke, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 20, 1983, Ser. No. 533,866

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235369

Int. Cl.[4] G01P *3/36;* G01N *21/00;* G01B *9/02;* G02B *6/26*

U.S. Cl. 356—28.5 **6 Claims**

1. A fiber-optical Doppler anemometer for measuring the Doppler broadening of laser light passing through a scattering

medium containing moving particles, which anemometer comprises:

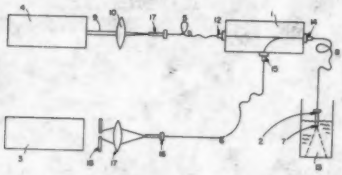
(a) a laser light emitting means;

(b) a fiber-optical coupler arranged to receive the laser light from the emitting means;

(c) a fiber optical probe submerged in the scattering medium and arranged

(c_1) to receive the light from the fiber-optical coupler, and

(c_2) to return the light scattered by the moving particles to



the fiber-optical coupler along with non-shifted light, said non-shifted light being coherent with the scattered light; and

(d) a photodetector device arranged to receive a beam of light split in said fiber-optical coupler, said light including both light scattered by the moving particles and light otherwise returned to the fiber-optical coupler, said photodetector serving to compare the frequencies of the light scattered by he moving particles and the light otherwise returned to the coupler from the optical probe.

4,637,717

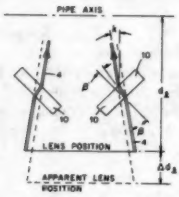
DUAL BEAM TRANSLATOR FOR USE IN LASER DOPPLER ANEMOMETRY

David M. Brudnoy, Albany, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 12, 1984, Ser. No. 599,291

Int. Cl.[4] G01P *3/36;* G02B *26/08*

U.S. Cl. 356—28.5 **30 Claims**



1. A method for attaining substantial spacial coincidence of the intersection volumes of two pairs of intersecting light beams in a fluid flow conduit in a Doppler anemometry device comprising focusing said two pairs of light beams with a beam focusing means and selectively translating the beam paths of at least one of said pairs of beams, said paths being translated in a direction parallel to the original beam paths by a pair of rotatable transparent optical means provided in said beam paths between said beam focusing means and said fluid flow conduit.

4,637,718

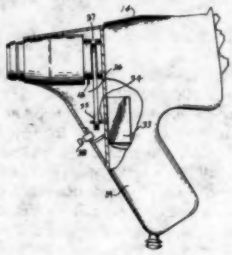
HAND-HELD OPTICAL FUEL PIN SCANNER

Tommy L. Kirchner, and Hurshal G. Powers, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 9, 1980, Ser. No. 214,806

Int. Cl.[4] G06K *9/24, 9/32*

U.S. Cl. 356—71 **7 Claims**



1. A portable, hand-held apparatus for optically scanning indicia imprinted about a planar end face of an article having an outer wall surface, said apparatus comprising:

a supporting frame;

light detector means fixed to said frame for digitizing light patterns directed thereto;

indexing means on said frame for engaging said planar end face and locating said end face in a preselected focal plane on the frame, said indexing means having an inner wall surface complementary to said article wall surface for disposition thereabout and terminating in an end portion beyond said planar end face, said inner wall surface having a radially inwardly extending shoulder spaced from said end portion and engagable with said planar end face;

light means directed onto said preselected focal plane;

optical means mounted on said frame about a central axis, said optical means being optically interposed between said indexing means and said light detector means for directing reflected light from said preselected focal plane to said light detector means and including a dove prism centrally aligned along said central axis;

and means for selectively rotating the dove prism relative to the frame about the central axis to thereby rotate the image from the focal plane as transmitted to said light detector means.

4,637,719

OPTICAL MEASUREMENT OF MARINE CONDITIONS

Alex W. Herman, Lower Sackville, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 14, 1984, Ser. No. 641,044

Int. Cl.[4] G01N *21/85, 21/59;* G06M *11/04*

U.S. Cl. 356—72 **13 Claims**

1. A method of simultaneously determining turbidity caused by small particles and the number of larger particles in a body of water, comprising

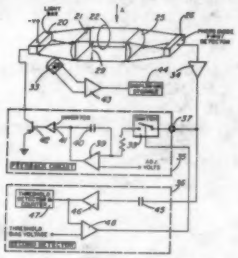
(a) transmitting in a predetermined direction a beam of light of substantially rectangular cross-section having a transmitted intensity,

(b) flowing a sample of said water through the transmitted beam in a direction substantially perpendicular to said transmitting direction,

(c) detecting a received intensity of the beam after passage through the water sample and generating a signal representative of such received intensity, said signal having a basic component corresponding to the turbidity of the water sample and short pulses each corresponding to

passage through the beam of an individual one of said larger particles in said water sample,

(d) causing variations in said basic component to modify the transmitted intensity of the beam before passage through the water sample in such a manner as to maintain said basic component at a substantially constant value,



(e) measuring said transmitted intensity as a determination of said turbidity, and

(f) counting the number of said short pulses as a measure of the number of said larger particles.

4,637,720

LENS METER HAVING A FOCUSING INDICATION SYSTEM WITH DIVIDED-IMAGE REGISTRATION FOCUSING

Moriyasu Shirayanagi; Osamu Shindo; Hirochika Aiura, and Tadao Hara, all of Tokyo, Japan, assignors to Ashahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,689

Claims priority, application Japan, Nov. 11, 1982, 57-198292

Int. Cl.⁴ G01B *9/00*

U.S. Cl. 356—125 **8 Claims**

1. A lens meter having a focusing indication system with a divided-image registration focusing, comprising:

a target having a non-diffusing transmissive surface and a slit pattern thereon;

a condenser lens for converging a source light toward said target, said condenser lens having a front focal point on a side of said condenser lens opposite said target;

an objective lens for receiving light passing through said slit pattern;

a lens mount for supporting a lens to be examined;

a projection lens downstream of said lens mount for receiving light from said objective lens after passing through said lens to be examined;

a screen for receiving light passing through said projection lens, the arrangement being such that the distance of movement in unison of said condenser lens and said target in the direction of an optical axis is read to detect the vertex power of the lens supported on said lens mount;

an aperture plate disposed in the vicinity of said front focal point of said condenser lens and movable with said condenser lens and said target in the direction of said optical axis; and

at least two deflection prisms disposed with first surfaces in intimate contact with said slit pattern on said target, said first surfaces extending across said slit pattern and being substantially perpendicular to one another;

wherein said aperture plate has an aperture size and each of said deflection prisms has a vertex angle, said aperture size and said vertex angle being determined such that registration sensitivity K, the registration sensitivity of images, ratio B_C, the ratio between luminances of the centers of the images, the ratio B_D, the ratio between luminances of the peripheries of the images, will meet the following relations:

$K \geqq 0.33$

$B_C \geqq 0.1$

$B_D \geqq 0.7$.

4,637,721

LIGHT MEASURING DEVICE

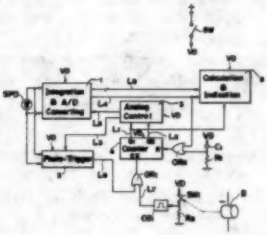
Kazuhiko Naruse, Nabari, and Yoshio Yuasa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1984, Ser. No. 580,116

Claims priority, application Japan, Feb. 16, 1983, 58-22172[U]

Int. Cl.⁴ G01J *1/46*

U.S. Cl. 356—215 **15 Claims**



1. A light measuring device having an electrical power supply and capable of starting its light measuring operation in response to receiving flash light from a flash device and also to activation of a manual operation, comprising:

light receiving means for receiving light to be measured to produce a light intensity signal representative of the intensity of the light received thereby;

detecting means for detecting any change of the light intensity signal to produce a first signal each time a change is detected;

signal producing means, including a manually operable member, for producing a second signal each time said manually operable member is operated;

measuring means for measuring the amount of light received by the light receiving means for a predetermined time period in accordance with said light intensity signal to produce a light measuring signal representative of the amount measured by said measuring means;

controlling means for controlling said measuring means in accordance with said first and second signals to enable the electrical power supply to said measuring means upon a first receipt of either of said first and second signals, and to start operation of said measuring means upon a second receipt of either of said first and second signals; and

indicating means for indicating a light measuring value in accordance with said light measuring signal.

4,637,722

FIBER OPTICAL ROTATION SENSOR WITH EXTENDED DYNAMIC RANGE

Byoung Y. Kim, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 25, 1983, Ser. No. 488,155

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—350 **34 Claims**

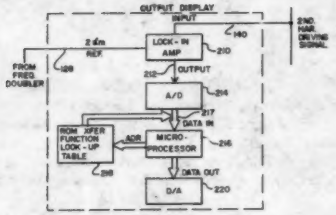
1. An apparatus for sensing an ambient effect such as rotation, comprising:

(A) a loop of fiber optic material for forming an optical path sensitive to said ambient effect;

(B) means for introducing light into said loop;

(C) means for sensing said light in said loop to produce a feedback signal responsive to said ambient effect;

(D) means, responsive to said feedback signal, for nulling said feedback signal, to increase the sensing range of said



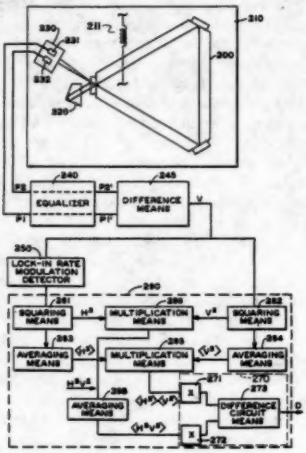
apparatus, said nulling means producing an output signal varying with said ambient effect in accordance with a non-linear relationship; and

(E) an output circuit for superimposing a non-linear transfer function on said output signal.

4,637,723
DISCRIMINANT APPARATUS FOR RING LASER ANGULAR RATE SENSORS

Werner H. Egli, Minneapolis, and Mark W. Weber, Elk River, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 430,052
Int. Cl.[4] G01B 9/02; H01S 3/083
U.S. Cl. 356—350 **25 Claims**



1. An apparatus for providing a discriminant signal indicative of the lock-in rate of an angular rate sensor of the class wherein two waves propagate in opposite directions along a closed-loop path, wherein the frequency of each of said waves is a function of the rate of rotation of said closed-loop path, said waves establishing a phase difference therebetween, and wherein said lock-in rate is the rate of rotation of said sensor below which said frequency of said waves tend to lock-in to a common frequency, and said lock-in rate is related to the coupling of energy between each of the said waves traveling along said closed-loop path, the apparatus comprising:

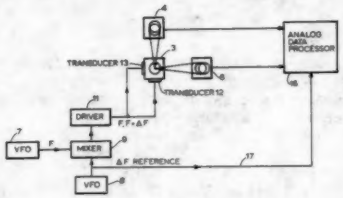
signal means responsive to each of said waves for providing an output signal related to said phase difference between said waves, said output signal having phase and amplitude modulation components resulting substantially from energy coupling between said waves; and

discriminant signal means for signal processing said signal means output signal to extract from said output signal a phase jitter signal representative of said phase modulation of said phase difference, said phase jitter signal providing said signal indicative of said lock-in rate.

4,637,724
SHEARING INTERFEROMETER EMPLOYING AN ACOUSTO-OPTIC CELL

Richard H. Howell, Melbourne, Fla., and Alan J. MacGovern, Acton, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Dec. 19, 1983, Ser. No. 562,656
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—353 **16 Claims**



1. In a lateral shearing interferometer having a distorted wavefront incident thereon, for determining relative phase differences between different areas of said distorted wavefront, and for generating signals indicative of said phase differences, and having first and second diffraction gratings, each of which has a slightly different grating frequency, for shearing the wavefront, the improvement comprising:

a. an acousto-optic cell for producing diffraction grating forming travelling acoustic waves therein in response to vibrational forces applied thereto;

b. electro-mechanical transducer means for producing first and second travelling acoustic waves within said cell;

c. electrical signal generator means for applying electrical signals having frequencies of F and F+delta F to said transducer means for producing said waves forming said first and second diffracting grating within said cell, said signal generator means being operable to change the frequency of said signals F and F+delta F through a given frequency range which changes the degree of angular displacement of a given order of diffracted light transmitted through said cell;

d. means for directing said wavefront at said cell; and

e. means for measuring the sheared wavefronts of a given order of light diffracted by said cell.

4,637,725
SELF-REFERENCING MACH-ZEHNDER INTERFEROMETER

Michael E. Stefanov, San Jose; Brian J. Sullivan, Menlo Park, both of Calif., and Anthony J. Ticknor, Tucson, Ariz., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Sep. 26, 1985, Ser. No. 780,520
Int. Cl.[4] G01B 9/02, 11/02
U.S. Cl. 356—354 **1 Claim**

1. A self-referencing interferometer of the Mach-Zehnder type for monitoring an optical beam wavefront in real time, said interferometer comprising:

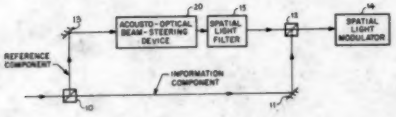
(a) beamsplitting elements and reflective elements for dividing said optical beam into an information component and a reference component, and for recombining said information component and said reference component to form an

interference pattern indicative of aberrations of said optical beam wavefront;

(b) a spatial light filter positioned to remove second-order aberrations from said reference component of said beam prior to recombination of said information component and said reference component, said spatial light filter having a pin-hole apertured portion for transmitting said reference component while removing said second-order aberrations; and

(c) acousto-optical beam-steering means for steering said reference component of said beam in real time to maintain substantially continuous alignment of a maximum-intensity centroid of said reference component with respect to said pin-hole apertured portion of said spatial light filter, said acousto-optical beam-steering means comprising:

(i) a pair of Bragg cells oriented in crossed configuration



with respect to each other, said Bragg cells being positioned so that said reference component of said beam passes through said Bragg cells in succession prior to being transmitted by said pin-hole apertured portion of said spatial light filter;

(ii) quadrant detector means;

(iii) beamsplitting means for passing a portion of said reference component of said beam from said pair of Bragg cells to said quadrant detector; and

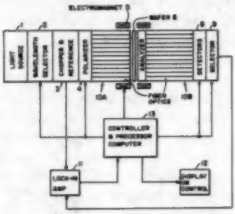
(iv) electronic circuitry responsive to intensity-indicative signals from said quadrant detector for adjusting acoustic grating characteristics of said Bragg cell in real time, said reference component of said beam thereby being deflectable as appropriate to maintain substantially continuous alignment of said maximum-intensity centroid of said reference component with respect to said pin-hole apertured portion of said spatial light filter.

4,637,726

NONDESTRUCTIVE NONCONTACT DEVICE TO CHARACTERIZE SEMICONDUCTOR MATERIAL

Clifford G. Walker, and George A. Tanton, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1985, Ser. No. 699,282
Int. Cl.[4] G01N *21/21*
U.S. Cl. 356—367 **10 Claims**



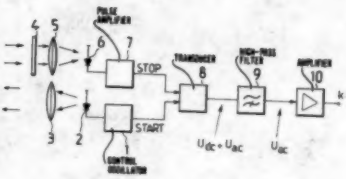
7. In a system for testing a device which will cause Faraday rotation (FR) of polarized light passing therethrough, the improvement comprising a light source for producing polarized light, a first means located between said light source and said device to be tested whereby light from said light source will be directed through said device to be tested, magnetic means positioned so as to produce a magnetic field through said device to be detected so as to cause FR of the polarized light passing through said device, and a plurality of detectors positioned to receive light from individual small areas of said device so as to detect any change in the characteristics of the polarized light cause by said device to be tested.

4,637,727

PROCEDURE FOR ANALYZING RECIPROCATING MOTION

Raimo Ahola, Alppitie 7 A 28, 90530 Oulu 53, and Risto Mylylä, Ketjutie 82, 90560 Oulu 56, both of Finland

Filed Dec. 8, 1983, Ser. No. 559,412
Claims priority, application Finland, Dec. 9, 1982, 824240
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—373 **8 Claims**



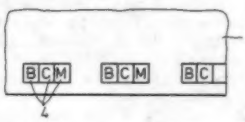
1. A method of measuring the reciprocating motion of a given object transverse to the running direction of the object, comprising the steps of: directing periodic light pulses on the object; receiving light pulses reflected back from the object; determining the change in the passage time between subsequent light pulses directed onto and reflected back from the object, in relation to a reference value; transforming said change into an analog voltage signal proportional to said change; and interpreting the alterations in said analog voltage signal as being proportional to alterations in position of the object in a direction transverse to the running direction of said object.

4,637,728

METHOD FOR COLORIMETRICALLY EVALUATING A SHEET PRINTED ON BOTH SIDES THEREOF

Helmut Kipphan, Schwetzingen, and Gerhard Löffler, Walldorf, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 497,748
Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219743
Int. Cl.[4] G01J *3/52*
U.S. Cl. 356—402 **5 Claims**



1. Method of colorimetrically evaluating a sheet printed on both sides thereof by means of a scanning densitometer having a measuring system and a mechanically controlled measuring head which is guided along a print control strip to be evaluated and which provides a multiplicity of color density values representing color properties of the control strip, which comprises assigning respective control strip measurement fields for different colors to respective printed parts on mutually opposite first form and perfector sides of a sheet, and forming a common control strip set out of all of the measurement fields,

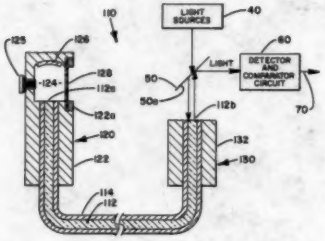
assigning to the measurement fields abbreviations for each of the respective ink colors in accordance with the colors to be printed, and introducing into the measuring system the color abbreviations assigned to the respective printing colors and to the respective sides of the sheet.

4,637,729

FIBER OPTIC MOISTURE ANALYSIS PROBE

Stephen A. Schoch, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,409
Int. Cl.[4] G01N *21/85*
U.S. Cl. 356—410 **4 Claims**



1. A probe for detecting the presence of a substance in a fluid comprising:

first body means to be sealingly secured in the wall of a casing containing a fluid to be tested;

a passage through said first body means defining a flow path;

first mirror means forming a portion of said passage;

first optical fiber means having one end received in said first body means and defining a first termination which is located across said passage from said first mirror means and forming a portion of said passage;

said first optical fiber means having a second end defining a second termination;

second body means to be sealingly secured in the wall of a casing containing a fluid to be tested;

a sealed chamber in said second body means containing a reference medium;

means for equalizing pressure in said sealed chamber with the pressure acting on said second body means;

second mirror means forming a portion of said sealed chamber;

second optical fiber means having one end received in said second body means and defining a first termination which is located across said sealed chamber from said second mirror means and forming a portion of said sealed chamber;

said second optical fiber means having a second end defining a second termination;

means for supplying light in a first wavelength which is attenuated in the presence of said substance and in a second wavelength which is not attenuated in the presence of said substance such that said light traverses a first path serially including said first optical fiber means from said second termination to said first termination, across said flow path where said light in said first wavelength is subject to attenuation due to the presence of said substance whereupon said light is reflected by said first mirror means and said light in said first wavelength is subject to further attenuation due to the presence of said substance and depending upon the attenuation said light enters said first termination of said first optical fiber means, passes through said first optical fiber means and out said second termination of said first optical fiber means and for supplying light in said first and second wavelengths to a second path serially including said second optical fiber means from said second termination to said first termination, across said sealed chamber to said second mirror means whereupon said light is reflected by said second mirror means and enters said first termination of said second optical fiber means, passes through said second optical fiber means and out of said second termination of said second optical fiber means; and

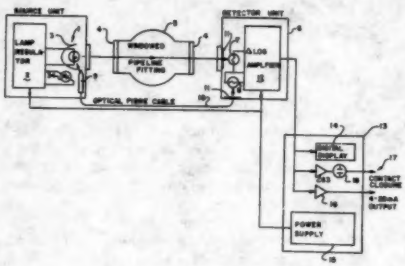
means for detecting the amount of light in both of said wavelengths passing out of each of said second terminations.

4,637,730

OPTICAL AND ELECTRONICALLY COMPARED ABSORPTIOMETER

Michael J. Ponstingl, Jefferson County; Walter N. Trump, and Robert C. Kessler, both of St. Louis County, all of Mo., assignors to Custom Sample Systems, Inc., St. Louis, Mo.

Filed Sep. 18, 1984, Ser. No. 651,802
Int. Cl.[4] G01N *21/85, 21/31*
U.S. Cl. 356—411 **5 Claims**



1. An optical absorptionmeter which is characterized by a light source unit of a broad wave length having a source of constant energy which is transmitted as two separate light beams, one of which is transmitted as a main light source beam through a flowing liquid or the like to be measured, and the other beam which is transmitted as a reference beam, said reference beam being tapped from the main light source beam, a power supply for said light source, silicon controlled rectifiers operatively associated with said power source and light source to finely regulate the lamp voltage, said constant energy of the light source being controlled by feed back circuitry, a detector unit which contains two photocells, a position means in the absorptionmeter for optically placing the liquid to be measured between the source unit and one of its photocells and the detector unit, one photocell for measuring the light transmitted through the liquid to be measured, and another photocell which measures the reference beam, a log amplifier electronically connected with the liquid measured photocell and yielding a voltage output logarithm proportional to the signal detected by said photocell, a second log amplifier electronically connected with the reference light detecting photocell and yielding a voltage output logarithm proportional to the reference signal detected by the said photocell which measures the reference beam and the inverter electrically connected with the said latter amplifier and inverting the detected and amplified reference detected voltage, means for measuring the energy difference between the light beams of the measured liquid and reference beam in terms of absorbance, said means comprising a summing point provided within the circuitry of the detector unit and furnishing a voltage detection equal to the difference between the reference and liquid measured yielded voltages, and means for converting this energy difference to an electrical signal for display and control, integrated circuit means electrically connected to said detector unit and capable of receiving said signal therefrom, providing a processing of the said signal and furnishing a readout of digital signals, and a digital display unit coupled to said integrated circuit means and capable of receiving said digital signals and

displaying the same, said digital display incorporating a LED display for visually displaying said processed signals.

4,637,731

DEVICE FOR MAKING POROUS CONCRETE

Per O. Dahlin, N. Sillre, Sweden, assignor to Cellexfabrikerna AB, Ange, Sweden

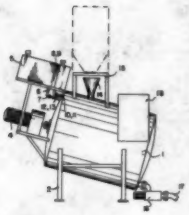
PCT No. PCT/SE84/00214, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO85/00136, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 7, 1984, Ser. No. 700,701

Claims priority, application Sweden, Jun. 20, 1983, 8303524

Int. Cl.[4] B28C *5/08*

U.S. Cl. 366—64 **4 Claims**



1. A device for mixing cement, water and a frothing agent in order to provide a porous concrete for casting, said device comprising

a cylindrical mixing tank which defines a central axis line therethrough and which has an interior surface that defines a mixing chamber therein, and

an impeller rotatably mounted in said mixing chamber within said cylindrical mixing tank, said impeller having a central axle which coincides with said central axis line of said cylindrical mixing tank, said impeller including a plurality of elongated blades that extend helicoidally with respect to said central axle of said impeller and adjacent said interior surface of said cylindrical mixing tank, each said blade consisting of first and second curved strips which extend in parallel to one another, said second strip being located radially outwardly of said first strip, said second strip being inclined along its length less than 90° with respect to the adjacent interior surface of said cylindrical mixing tank, said second strip having along its length a side edge which is adjacent said interior wall of said cylindrical mixing tank.

4,637,732

HAND HELD ATHLETIC OFFICIATING TIMERS

Charles Jones, Rte. 3 Hwy. 29 S., Hope, Ark. 71801; James L. Murphy, and Kenneth Burks, both of Little Rock, Ark., assignors to Charles Jones, Hope, Ark.

Filed Dec. 5, 1983, Ser. No. 557,909

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—109 **3 Claims**

1. A hand-held football timer for referees, officials, coaches, umpires or similar users, the timer comprising:

a rigid enclosure adapted to be selectively manually grasped or otherwise retained by said user, said enclosure being geometrically configured to readily facilitate ambidextrous usage by said user;

electronic circuit means disposed within said enclosure for generating an alarm signal when approximately twenty five seconds have elapsed after actuation of said circuit means; said circuit means comprising:

oscillator divider means for generating a first, football timing signal;

triggered counter means for generating second and third football timing signals in response to said oscillator divider means;

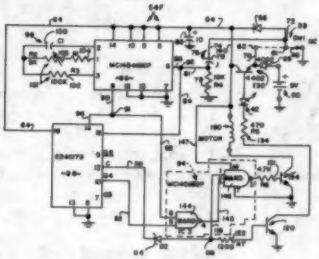
initiation means for initially activating said oscillator divider means and said triggered counter means in response to said primary switch means;

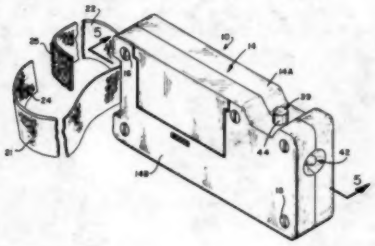
gate means responsive to said first, second and third football timing signals for generating a fourth football timing signal;

motor means for vibrating said enclosure; and,

means responsive to said fourth football timing signal for logically controlling said tactile stimulation means;

tactile stimulation means disposed within said enclosure for generating a warning in response to said alarm signal, said tactile stimulation means comprising means for vibrating said enclosure and thus physically stimulating at least a portion of the body of said user to immediately warn said





user notwithstanding where the user may be looking at the time;

user activated primary switch means for manually activating said circuit means, said circuit means including latching means for temporarily latching said primary switch means after initial activation of said primary switch means and means for unlatching said latching means after approximately twenty five second;

battery means disposed within said enclosure for powering said timer;

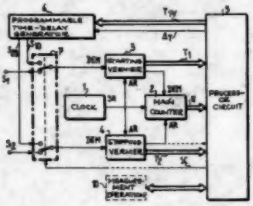
low battery signalling means for warning said user that said battery means is worn out immediately upon activation of said primary switch means; and,

means for immediately providing a visual warning that said battery means is not dead in response to activation of said primary switch means.

4,637,733
HIGH-RESOLUTION ELECTRONIC CHRONOMETRY SYSTEM

Gilbert Charles, Bures sur Yvette; Assad Assadoullah, Bagneux, and Jean-Marie Bernet, Chambourcy, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 15, 1985, Ser. No. 734,195
Claims priority, application France, May 17, 1984, 84 07652
Int. Cl.[4] G04F *8/00*
U.S. Cl. 368—120 8 Claims



1. An electronic chronometry system for measuring a time period T between a starting instant T_1 and a stopping instant T_2, comprising:

a ramp vernier fine counting means having a time expansion means for measuring said first time T1 between said starting instant and a first later front of a clock signal and for measuring a second time T2 between said stopping instant and a second later clock front;

rough counting means for counting N clock periods of time τ between said first and second fronts;

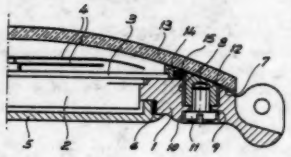
compensation means for compensating for errors of ramp nonlinearity in order to determine both the magnitude and sign of a corrective term (dm) applied to said compensation means at a measured time wherein the output of said compensation means is fed to a calibration cycle means which operates as a function of said first time and the difference between said first time and said second time in order to produce a corrective value ($N\tau+T1-T2+dm$).

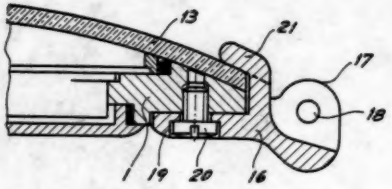
4,637,734
WATCH CASE

Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Lengnau, Switzerland

Filed Jul. 8, 1985, Ser. No. 752,681
Claims priority, application Switzerland, Jul. 12, 1984, 3383/84
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—294 6 Claims

1. A watch case comprising a caseband, a crystal of mineral material the peripheral part of which rests on the caseband and entirely covers it, and a back cover, each of these three elements comprising an outer surface and an inner surface which defines a receptacle intended to accommodate a movement surmounted by a dial, and means for fastening the crystal to the caseband, wherein the inner and outer surfaces of the crystal are both entirely defined by a sphere portion, and at least a part



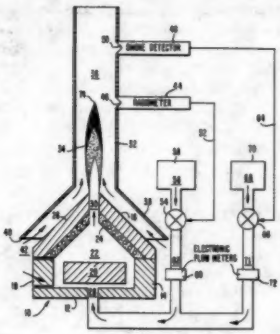


of the crystal periphery is located at a level below that of the dial.

4,637,735
BENCH-SCALE MATERIAL FLAMMABILITY TEST APPARATUS AND PROCESS FOR MEASURING FLAMMABILITY

John de Ris, and George H. Markstein, both of Sharon, Mass., assignors to Factory-Mutual Research Corporation, Norwood, Mass.

Continuation of Ser. No. 569,651, Jan. 10, 1984, abandoned. This application Jan. 27, 1986, Ser. No. 823,124
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—8 19 Claims



1. A bench-scale apparatus for measuring the heat-release rate of pyrolysis vapors of a material sample comprising

an oven defining a heat chamber for receiving said sample, a flue, and at least one entry port,

a radiometer having a radiation sensor disposed in relation to said flue such that an area into which burning pyrolysis vapors are directed from said flue is adjacent to said radiation sensor,

a flue-gas control valve in communication with said port, and

an electronic flow meter for measuring the amount of fuel-gas passing through said control valve,

wherein signals from said radiometer operate said fuel-gas control valve to provide an amount of fuel-gas sufficient to maintain a flame of said vapors at a predetermined height, and wherein said meter measures said amount of fuel-gas such that the measurement of said meter is used as an indication of the heat-release rate of said pyrolysis vapors, whereby larger amounts of measured fuel-gas indicate lesser sample heat release rates and smaller amounts of fuel-gas indicate greater sample heat release rates.

2. The apparatus of claim 1, further comprising

a smoke detector having a smoke sensor disposed in relation to said flue such that said area is adjacent to said smoke sensor,

a diluent control valve in communication with said port, and

a second electronic flow meter for measuring the amount of diluent passing through said diluent control valve,

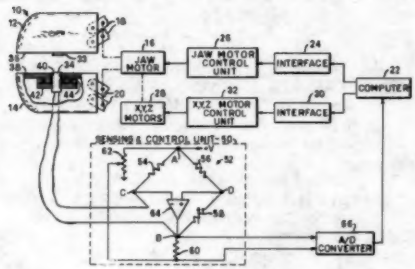
wherein signals from said smoke detector operate said diluent control valve to provide an amount of diluent sufficient to maintain the sootiness of said flame at a predetermined level, and wherein said second meter measures said amount of diluent such that the measurement of said second meter is used as in indication of the sootiness of said pyrolysis vapors, whereby larger amounts of measured diluent indicate greater sootiness and smaller amounts of measured diluent indicate lesser sootiness.

4,637,736

SLIP SENSING METHOD AND APPARATUS

Gerry B. Andeen, Menlo Park; Eric J. Shrader, Palo Alto, and Roy D. Kornbluh, Redwood City, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Apr. 19, 1985, Ser. No. 725,127
Int. Cl.[4] G01K *7/00*; B25J *15/02*
U.S. Cl. 374—45 **15 Claims**



4. Slip sensing means for sensing slip between an object and object supporting means having at least one supporting surface, said slip sensing means comprising

thermal responsive means located at the supporting surface of the object supporting means and adapted for intimate engagement with the face of an object supported thereby,

means for electrically heating said thermal responsive means to maintain the temperature thereof and the localized temperature of the object at the point of engagement therewith above ambient temperature, the temperature at the surface of the object decreasing with distance from the heated thermal responsive means, the temperature of the thermal responsive means at least momentarily changing with initial engagement thereof with the object and with slip of the object along the object supporting means after said initial engagement, and

means for detecting change in the thermal responsive means in response to temperature change thereof due to slip of the object along the object supporting means for sensing said slip,

said thermal responsive means comprising a thermistor,

said means for electrically heating said thermistor comprising a resistor bridge, one arm of which bridge comprises said thermistor,

a load resistor,

a source of d.c. potential connected across one pair of opposed bridge junctions through said load resistor,

operational amplifier means having a pair of input terminals connected across the other pair of opposed bridge junctions, and

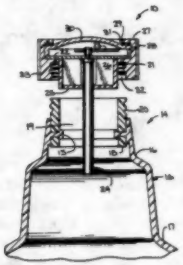
means for connecting the operational amplifier means output to the one bridge junction to which said thermistor and load resistor are connected, said thermistor providing a negative feedback path for said operational amplifier means.

4,637,737

APPARATUS FOR MEASUREMENT OF WATER CONDITIONS IN A WATERMATTRESS

Dominic A. Ricchio, 6021 56th Ave., Kenosha, Wis. 53142

Continuation-in-part of Ser. No. 526,441, Aug. 25, 1983, abandoned. This application Sep. 10, 1984, Ser. No. 648,827
Int. Cl.[4] G01K *1/14*
U.S. Cl. 374—141 **8 Claims**



1. A gauge for quantitative measurement within a water-filled mattress of the type having an open-ended, recessable filler spout, the gauge comprising:

a cylindrical stopper that fits closely around an inside wall of the recessable filler spout of said water-filled mattress to maintain a cylindrical shape for the filler spout, wherein the stopper has an end that fits closely around the open end of the filler spout;

a quantitative measuring instrument with a sensing stem extending through the cylindrical stopper and with a crystal disposed above the end of the stopper to permit observation outside the mattress of measurements sensed by said instrument, wherein the sensing stem extends to a depth where the sensing stem is in thermal contact with the water when the filler spout is in a recessed position; and

an annular hold-down member that runs around the crystal and the filler spout to secure the stopper in sealing relationship with the filler spout;

said cylindrical stopper, measuring instrument crystal and annualr hold-down member forming a blunt-ended cap with a profile that is non-interfering with use of the mattress when the recessable filler spout is moved to its recessed position.

4,637,738

ALIGNMENT COMPENSATOR FOR LINEAR BEARINGS

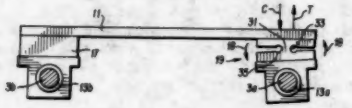
Vincent Barkley, 702 Oella Ave., Ellicott City, Md. 21043

Filed Jul. 31, 1985, Ser. No. 760,949
Int. Cl.[4] F16C *29/12*
U.S. Cl. 384—38 **17 Claims**

1. An alignment compensator for use with a linear bearing mounted on a first support member aligned substantially paral-

lel with a second support member, the first and second support members supporting a movable carriage, said compensator comprising:

a body member formed of an elastically deformable material, said body member having angular deflection means for



compensating for misalignment between said first and second support members via angular elastic deformation of said body member, said angular deflection means comprising substantially rigid support means for maintaining close tolerances between said carriage and said first and second support members.

4,637,739

LINEAR GUIDE DEVICE

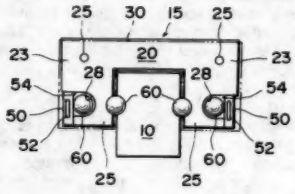
Masaru Hattori, Machashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,588

Claims priority, application Japan, Nov. 10, 1984, 59-169819[U]

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 384—45 **4 Claims**



1. A linear guide device comprising:

a rail extending axially and having ball rolling grooves formed lengthwisely thereof in the opposite outer sides thereof; a bearing body of saddle-like shape mounted on said rail and having in the opposite inner sides thereof ball rolling grooves each being opposed to said each ball rolling groove and having in the opposite outer sides thereof open concave grooves formed lengthwisely thereof; closure members each having sufficient width and length to cover said each concave groove; a pair of end caps mounted on the opposite ends of said bearing body and supporting the opposite end portions of said closure members, ball return holes being formed by said concave grooves and said closure members, said end caps being formed with ball circulation holes connecting said ball rolling grooves to said ball return holes; and a number of balls inserted in said ball rolling grooves, said ball return holes and said ball circulation holes.

4,637,740

BEARING BUSHING FOR UNIVERSAL JOINTS

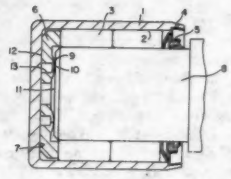
Armin Olschewski, Schweinfurt; Bernhard Bauer, Hassfurt; Elisabeth Zirk, Dittelbrunn, and Rut Heemskerk, Pfandhausen, all of Fed. Rep. of Germany, assignors to SKF GmbH Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 787,807

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 8430909[U]

Int. Cl.⁴ F16C *17/08*; F16D *3/20*

U.S. Cl. 384—425 **3 Claims**



1. For a bearing bushing of generally cup-like form for universal joints including a universal joint pin, a disk-like check plate having opposing side faces disposed between an axial end face of the pin and a bottom wall of the bushing, a plurality of spaced discrete projections extending outwardly from one side face of said check plate confronting the pin, said projections arranged in a generally circular array and being circumferentially spaced relative to one another, a plurality of recesses extending inwardly from the other face of said check plate aligned with said projections extending inwardly a predetermined distance to define a thin-walled flexible dome-shaped projection, the wall thickness of the check plate surrounding and adjacent said projections being substantially greater than said dome-shaped projections.

4,637,741

PEDAL CARRIER, IN PARTICULAR FOR A CLUTCH AND BRAKE, ON A MOTOR VEHICLE

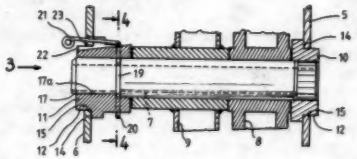
Guy Gillet, Marines, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly-Sur-Seien, both of, France

Filed Nov. 20, 1984, Ser. No. 673,368

Claims priority, application France, Nov. 23, 1983, 83 18662

Int. Cl.⁴ G05G *1/14*; B60K *23/02*; B60T *7/06*

U.S. Cl. 384—428 **4 Claims**



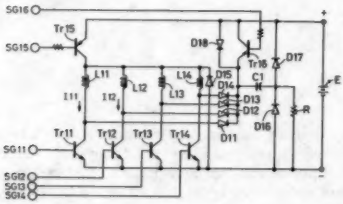
1. A pedal carrier device comprising a support having two spaced-apart side walls each defining an aperture, a pin carrying at least one pedal, for example a clutch or brake pedal, and disposed between said two side walls of a support, said pin having end portions, a sleeve engaged on each end portion of the pin and comprising a generally circular-shaped bearing surface including two parallel flat portions, each bearing surface being cooperative with an inner contour of a respective one of said apertures which has the same diameter and communicates with an edge of the respective side wall through a passage whose width is slightly greater than the distance between the flat portions of the respective sleeve, and means for immobilizing the assembly formed by the pin and the sleeves

relative to the side walls, one end of the pin being fixed to a first sleeve of said sleeves while the other end of the pin is freely engaged in a second sleeve of said sleeves, said immobilizing means comprising a first means for immobilizing in rotation the pin relative to the second sleeve, a second means for immobilizing in translation the pin relative to the second sleeve, a third means for immobilizing in rotation said assembly relative to the support and a fourth means for immobilizing in translation said assembly relative to the support, said second means and said third means being formed by a U-shaped resilient member having branches, two transverse opposed recesses in the second sleeve, and a groove in the pin, said branches being simultaneously engaged in said two recesses, said U-shaped member including an extension portion which is substantially parallel to the pin and the respective side wall defining a notch in which notch is resiliently engaged said extension portion, said notch communicating with the aperture in which the second sleeve is engaged.

4,637,742
WIRE DRIVE CIRCUIT IN DOT-MATRIX PRINTER

Kiyoharu Sakai, Suzuka, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 10, 1985, Ser. No. 742,907
Claims priority, application Japan, Jun. 15, 1984, 59-124194
Int. Cl.⁴ B41J *9/38, 3/12*
U.S. Cl. 400—121 **9 Claims**



1. A wire drive circuit in a dot-matrix printer, having a plurality of solenoids for actuating individual print wires, a power-on/off switching element connected commonly to a first end of each of the solenoids, a plurality of solenoid-selecting switching elements, each of the solenoid-selecting switching elements being connected in series to a second end of a respective solenoid, and a DC power supply connected between the power-on/off switching element and the solenoid-selecting switching elements, the solenoids being selectively energized by turning on said power-on/off switching element and respective one of the solenoid-selecting switching elements, whereby the print wires are selectively actuated under selective energization of the respective solenoids, said wire drive circuit further comprising:

a plurality of recifying elements connected to said second ends of the solenoids;

a discharge switching element connected to said second ends of said solenoids through the respective rectifying elements, said discharge switching element being turned on and off when said power-on/off switching element is turned off and on, respectively, to discharge electric energy which is produced by the solenoid previously energized when said power-on/off switching element in turned on;

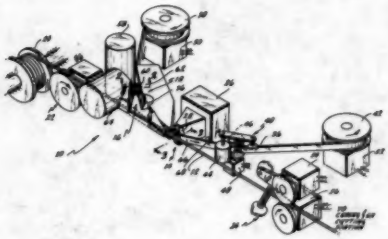
main energy-absorbing means, connected to said discharge switching element, for absorbing said electric energy while said discharge switching element is on; and

an auxiliary energy-absorbing capacitor connected to said second ends of said solenoids through said rectifying elements, to absorb a portion of said electric energy which has not been discharged through said discharge switching element, after the discharge switching element is turned off.

4,637,743
MATRIX PRINTER AND INKER FOR INDEFINITE LENGTH ARTICLES

Aron Kerner, 1531 N. Fuller Ave. Apt. 27, Los Angeles, Calif. 90046, and Andrei Grombchevsky, 24 Lancewood Way, Irvine, Calif. 92715

Continuation of Ser. No. 653,083, Sep. 21, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 798,139
Int. Cl.⁴ B41F *17/10;* **B41J** *3/20, 31/14, 35/04*
U.S. Cl. 400—124 **11 Claims**



1. A printer for printing both variable and repetitive information on a moving surface as such surface passes by a printing station, said printer comprising:

stationary dot matrix impact printing means for imprinting markings on a face of a moving substrate at a printing station;

substrate transport means for transporting said substrate continuously past said printing station in a first direction at a controlled rate;

web transport means for transporting an uninked foil element in said first direction past said printing station once between said face and said printing means from a web supply member to a web takeup member, said printing station being between said supply and takeup members;

detachable inking means including an ink supply and ink applicator means unitary with said ink supply for applying a marking media to a first previously uninked surface of said foil element as said foil element passes in said first direction between said supply member and said printing station, said first surface being disposed in position to contact said face responsive to the action of said printing means whereby said marking media is transferred from said first surface to said face at said printing station said inking means including said ink applicator means being readily detachable as a unit without removal or exchange of said foil element; and

control means for coordinating the operation of said respective printing, substrate transport and web transport and for permitting continuous variation in said markings without interrupting said operation.

4,637,744
ACTUATION DEVICE FOR TWO TYPEWRITER FUNCTIONS

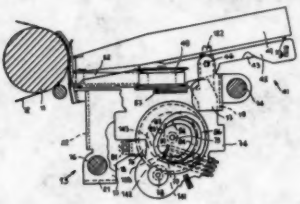
Franco Valle, and Pietro Musso, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Continuation of Ser. No. 252,416, Apr. 9, 1981, Pat. No. 4,472,073. This application Jul. 22, 1983, Ser. No. 516,429
Claims priority, application Italy, Apr. 15, 1980, 67581 A/80
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.⁴ B41J *5/30*
U.S. Cl. 400—185 **13 Claims**

1. In a typing machine comprising a platen including a typ-

ing point, a typing ribbon, typing ribbon feed means actuatable for feeding said typing ribbon, a correcting ribbon, a supporting frame for supporting the correcting ribbon, and lift means actuatable for moving the supporting frame between an inoperative position and an operative position, wherein the correcting ribbon is away from the typing point when the supporting frame is in said inoperative position and wherein the correcting ribbon is in front of the typing point for correction of a printed character where the supporting frame is in said operative position, the combination comprising:

a reversible motor having a rotatable motor member, means



controlling said reversible motor for causing said rotatable motor member to execute bidirectional cyclic rotations,

first means responsive to a cyclic rotation of said rotatable motor member for actuating said typing ribbon feed means, and

second means responsive to a unidirectional cyclic rotation of said rotatable motor member according to a given sense of rotation for actuating said lift means, and wherein said second means remain inoperative over said supporting frame upon cyclic rotations of said rotatable motor member opposite to the given sense of rotation of said rotatable motor member.

4,637,745

MELT DISPENSERS

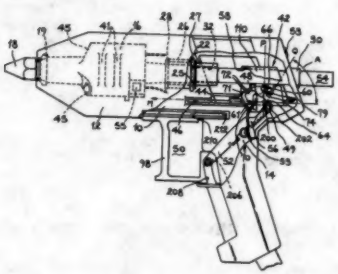
Joachim Speisebecher, Oberursel, and Christian Wooge, Bad Homburg, both of Fed. Rep. of Germany, assignors to USM Corporation, Flemington, N.J.

Filed Jul. 17, 1985, Ser. No. 755,805

Claims priority, application United Kingdom, Jul. 28, 1984, 8419303

Int. Cl.[4] B67D *5/32*

U.S. Cl. 401—1 **16 Claims**



1. A heat conductive melt body comprising a chamber for melting solid composition provided in the form of a rod the chamber having an inlet through which a rod of composition may be inserted into the chamber and an outlet from which melted composition may be dispensed, fin elements disposed lengthwise within the chamber and of progressively increasing size considered in a direction extending from the inlet to the outlet, the fin elements being so shaped and located that edge surfaces thereof disposed towards an interior of the chamber define surface portions of an opening of progressively reducing cross section the peak of which opening is located adjacent to the outlet but on the inlet side thereof and so that end portions of the fin elements at the outlet are spaced to define a series of exit slots spaced about an axis of the opening to provide the outlet, and at least one housing for receiving electrically operated heating means for heating the melt body.

4,637,746

DISPENSER FOR A TWO-COMPONENT ADHESIVE

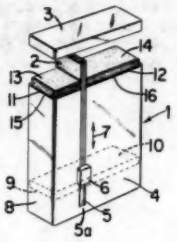
Peter Vierkötter, Leverkusen, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 16,549, Mar. 1, 1979, abandoned. This application May 6, 1981, Ser. No. 260,940

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810408

Int. Cl.[4] B05C *17/00*; A45D *40/24*; B67D *5/42*

U.S. Cl. 401—82 **2 Claims**



1. Dispenser for dispensing two components in a volumetric mixing ration with two chambers each provided to receive one of the components in the mixing ratio corresponding to the volumetric ratio of the components, where the chamber bottoms are provided with slidable pistons for simultaneously pushing the contents of the chambers out of the dispenser, characterized in that the dispenser is a hollow right prism divided by a self-supporting partition of the length of said chambers and extending parallel to the longitudinal axis of the prism and displaceable in the direction of this axis and extending between the walls of said chambers whereby accidental mixing of said components in the chambers is prevented, that pistons forming the bottom surfaces of the chambers are laterally attached to the bottom end of the partition facing the bottom of the dispenser, that stripping edges are present at the top of said chambers, that a slot is provided in one wall of the dispenser along one edge of the partition, and that the partition has a lug directly attached therewith, said lug projecting to the outside through said slot to move the partition and attached pistons up and down in the dispenser and being operated from the outside of the dispenser to displace the partition in a direction parallel to the longitudinal axis of the prism.

4,637,747

DEVICE FOR MOUNTING A PROTECTIVE CAP ON A SUPPORT

Alain Perrin, Bobigny, and Patrice Moinard, Montreuil, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Aug. 23, 1984, Ser. No. 643,600

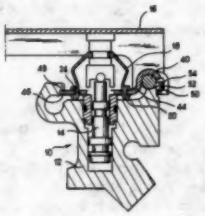
Claims priority, application France, Sep. 19, 1983, 83 14860

Int. Cl.[4] F16B *1/04*

U.S. Cl. 403—23 **6 Claims**

1. A locking member for mounting a protective cap on a support, the support having a first bearing surface and a base surface which is intended to be at least partially protected by the protective cap, the locking member comprising a first end

joined to the periphery of the cap and the locking member extending between the first end and the first bearing surface, characterized in that the support includes a second bearing surface located adjacent a seat for receiving pin means, the locking member having a first portion engaging the first bearing surface and a second portion which extends over the seat to



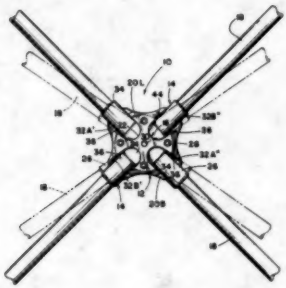
engage the second bearing surface, the second portion including a complementary shaped portion for the pin means, the locking member maintained in position by the pin means which is disposed between the seat and complementary shaped portion so that the first portion and second portion engage, respectively, the first and second bearing surfaces.

4,637,748

HUB AND STRUT-ENDCAP ASSEMBLY FOR TENT FRAME STRUTS

Allan E. Beavers, Littleton, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Jun. 7, 1985, Ser. No. 743,983
Int. Cl.[4] F16B *17/00*
U.S. Cl. 403—170 **10 Claims**



1. The self-adjusting hub and strut-endcap assembly for tent frame roof and wall struts which comprises: a hub two piece member shaped and joined together to provide four ball-receiving sockets arranged in equiangularly-spaced relation around the center thereof with each such socket adapted to receive and retain a ball for universal movement therein, and said hub member including side-opening channel-forming entryways leading into each socket, said entryways each having divergent sidewalls bordering a pair of intersecting seats at the base thereof bearing an acute angular relation to one another, one of said pair of seats extending radially outward from its ball-receiving socket while the other of said paired seats is skewed with respect to said radially-extending one, and diametrically-located pairs of said entryways having their skewed seats opposite one another; and, four strut-endcap elements each having a ball on the inner end thereof and a tubular sleeve projecting outwardly from said ball for receiving the inner end of a tent frame strut, said ball when seated in a ball-receiving socket in the hub being shaped and adapted to align the sleeve depending therefrom for limited side-to-side movement between a first position seated in the radially-extending seat of the flared entryway and a second position seated in the skewed seat thereof, said hub member and strut-endcap elements cooperating with one another in assembled relation with the sleeves seated in their first positions to define an assembly specifically adapted to the formation of a square wall or roof frame, and said member and elements cooperating with said sleeves seated in their second positions to define a four-sided polygonal frame having at least two unequal sides.

4,637,749

CONNECTOR FOR MODULAR PHYSIOLOGICAL INSTRUMENTS

Paul W. Jones, Issaquah; Rodney J. Merry, Bothell, and Gregory A. Linstad, Woodinville, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Filed Jan. 8, 1985, Ser. No. 689,743
Int. Cl.[4] F16B *21/00*; E04G *4/00*
U.S. Cl. 403—322 **16 Claims**

1. An apparatus for connecting first and second physiological instrument components, the first component having an exterior first surface and the second component having an exterior second surface, the apparatus comprising:

means forming a plurality of mutually parallel blades extending outward at the first surface at an acute angle with respect to a direction normal to the first surface;

means forming a plurality of mutually parallel slots extending inwardly at the second surface at said acute angle with respect to a direction normal to the second surface, the slots being sized and spaced to receive the blades to thereby connect the components; and

latch means for selectively engaging and securing one of the blades in its corresponding slot such that the blade cannot be removed from the slot without disengaging the latch means from the blade.

4,637,750

EVAPORATIVE COOLER BLOWER ROTOR-SHAFT SECURING HUB

Edward F. Ward, 8802 CRB, Tucson, Ariz. 85738

Filed May 14, 1984, Ser. No. 610,276
Int. Cl.[4] F16C *25/00*
U.S. Cl. 403—344 **2 Claims**

1. A securing hub adapted to secure a bushing to a central shaft comprising:

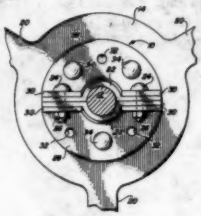
a first strap defining a semi-circle adapted to encircle a portion of the central shaft, said first strap also including a pair of oppositely protruding ears adapted to protrude from the central shaft, each of said pair of ears including an opening therethrough;

a second strap defining a semi-circle adapted to encircle a portion of the central shaft, said second strap also including a pair of oppositely protruding ears adapted to protrude from the central shaft, each of said pair of ears including an opening therethrough; said first and second

straps adapted to co-act in surrounding the central shaft with one of each pair of ears of said first and second strap proximate each other, on opposite sides of the central shaft, and openings aligned;

a first flange adapted to be secured to the bushing and to be secured to said first strap, said first flange defining concentric half circles with a pair of spaced apart right angle brackets attached thereto, each of said pair of brackets including an opening therethrough;

a second flange adapted to be secured to the bushing and to be secured to said second strap, said second flange defining concentric half circles with a pair of spaced apart right angle brackets attached thereto, each of said brackets



including an an opening therethrough, both of each of said first and second flange right angle bracket openings adapted to coincide with said openings of said first and second strap protruding ears respectively; and

a plurality of bolts and nuts adapted to penetrate the aligned openings of said first and second strap, and said first and second flanges respectively, on both sides of the central shaft in order that said nuts may be tightened upon said bolts to compress and secure said first and second straps against the central shaft and to secure said first flange to said first strap and said second flange to said second strap whereby the bushing, being secured to said first and second flange, is thereby secured to the central shaft.

4,637,751

COUPLING DEVICE FOR AGRICULTURAL IMPLEMENTS

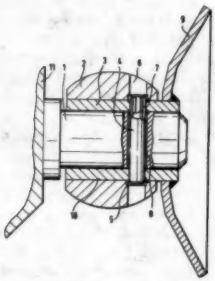
Jürgen Vollmer, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar/Rhld., Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,838

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439430

Int. Cl.[4] F16B *7/10*

U.S. Cl. 403—379 **2 Claims**



1. A coupling device for enabling connection of a coupling hook associated with the lower steering arm of a three-point attaching device with a coupling pin of a heavy agricultural implement comprising:

a coupling pin connected with a frame of said agricultural implement;

a slip-on sleeve arranged to be affixed to said coupling pin;

a catch ball having a longitudinal throughbore for receiving said slip-on sleeve therein;

a catch profile fixed to an outer end of said slip-on sleeve;

a first transverse bore in said catch ball;

a second transverse bore in said slip-on sleeve;

a third transverse bore in said coupling pin;

said first transverse bore having a diameter greater than the diameters of said second and third transverse bores;

axial securing means extending through said second and third transverse bores having ends projecting from both sides of said slip-on sleeve for fixing said slip-on sleeve and said coupling pin together; and

an annular groove formed in said catch ball opening into said longitudinal throughbore and arranged to receive therein said ends of said securing means extending from said slip-on sleeve with clearance all around.

4,637,752

ACCESS COVERS FOR MANHOLES

Antony R. Centa, Howe Green Lane, Little Berkhamsted, Hertford, Hertfordshire, England (3G13 8LH)

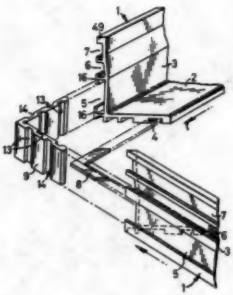
PCT No. PCT/GB84/00280, § 371 Date Apr. 17, 1985, § 102(e) Date Apr. 17, 1985, PCT Pub. No. WO85/00843, PCT Pub. Date Feb. 28, 1985

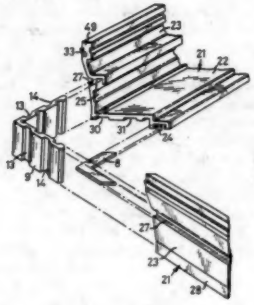
PCT Filed Aug. 13, 1984, Ser. No. 726,898

Claims priority, application United Kingdom, Aug. 18, 1983, 8322225

Int. Cl.[4] E02D *29/14*

U.S. Cl. 404—25 **4 Claims**





1. An access cover comprising an outer frame and a remov-

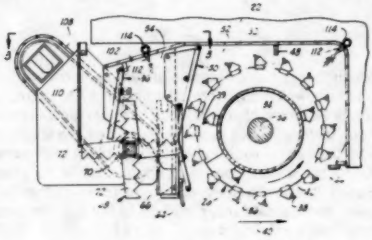
able cover member which fits within said outer frame, the cover member comprising an inner frame with an appropriate filling, each said frame being shaped in plan to provide corners and being fabricated from a plurality of lengths of angle-section frame members, each comprising interconnected wall and ledge portions, mitred at their ends to facilitate being joined to each other by joints at said corners to define a substantially vertical wall, formed from said wall portions, and a substantially horizontal ledge, formed from said ledge portions, extending inwardly from the vertical wall, the joint at each corner including an angular corner member with limbs to which the frame members are connected, wherein said lengths of frame members are metal extrusions each formed with a longitudinally extending captive groove in its wall portion, each said angular corner member being shaped so that its limbs fit around the corner within said captive grooves of the associated wall portions, said captive grooves being coaligned, said corner members each defining at least one vertical groove in each of its limbs with a respective wall of each said vertical groove being angled to provide opposed sloping receiving faces in one limb relative to the other limb and, for each corner, the respective frame members being joined together by simultaneously piercing tongues from their wall portions and crimping said tongues directly into positive engagement against the slope of the receiving faces of the corner member to urge the frame members together at the corner concerned.

4,637,753

ROAD PLANAR HAVING PARTICLE REDUCING MEANS

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Nov. 19, 1984, Ser. No. 672,939
Int. Cl.[4] E01C *23/12*
U.S. Cl. 404—90 **9 Claims**



1. In a road planar adapted to travel in a forward direction during a planing operation:

housing means forming a primary cutting chamber and a secondary cutting chamber to the rear of and communicating with the primary cutting chamber;

primary cutter means in the primary cutting chamber mounted for rotation about an axis extending transversely with respect to the planar and adapted to remove chunks of pavement material and direct said removed pavement material rearwardly toward the secondary cutting chamber;

first grid means carried by the housing means between the primary and secondary cutting chambers for sizing the removed pavement material moving from the primary cutting chamber to the secondary cutting chamber;

secondary cutting means mounted in the secondary cutting chamber having radial arms thereon, said secondary cutting means being mounted for rotation whereby said arms move through said first grid means to break up removed pavement material impinging on said first grid means; and

second grid means carried by the housing means in the secondary cutting chamber arranged to the rear of the first grid means in the path of movement of the removed pavement material in a position where said arms pass therethrough to further break up and size the removed pavement material.

4,637,754

LINING OF PIPELINES AND PASSAGEWAYS

Eric Wood, Northants, United Kingdom, assignor to Insituform Holdings Limited, Douglas, Isle of Man

Filed Dec. 14, 1984, Ser. No. 681,964
Claims priority, application United Kingdom, Jan. 7, 1984, 8400364
Int. Cl.[4] E21D *11/38*; B29C *63/36*
U.S. Cl. 405—150 **7 Claims**

1. A method of lining a pipeline or passageway comprising the steps of:

A. inserting pads of resin absorbent material impregnated with a curable synthetic resin into the pipeline or passageway at spaced intervals by driving an anchoring pin through each pad into a wall of the pipeline or passageway so that a head of said pin traps the respective pad to said wall while leaving an overlapping portion of the pad surrounding the head of the pin;

B. inserting into the pipeline or passageway, before the resin impregnating said pads of material has cured, a resin impregnated tubular liner presenting a face of uncured resin to said pads so that the uncured resin face of the liner comes into resin contact with the overlapping portions of the pads of resin absorbent material; and

C. curing the resin of the pads of resin absorbent material and the liner such that the pin heads become embedded in cured resin and provide compressive hoop stress reinforcement for the liner.

4,637,755

APPARATUS FOR BURYING CONDUIT

Scott Tollefson, 508 E. Irene, Casa Grande, Ariz. 85222; Howard A. Wuertz, and Charles R. Schultz, both of Rte. 1, Box 115A, Coolidge, Ariz. 85228

Continuation-in-part of Ser. No. 607,407, May 7, 1984, abandoned, which is a continuation of Ser. No. 467,383, Feb. 17, 1983, Pat. No. 4,447,173. This application Nov. 19, 1984, Ser. No. 672,958
Int. Cl.[4] E02F *5/10*
U.S. Cl. 405—181 **1 Claim**

1. Apparatus for burying tubing from a supply thereof in a plowed field having

a plurality of general parallel elongate, upstanding, spaced beds of earth, and

a plurality of elongate spaced furrows, each furrow generally lying along and following a generally horizontally oriented imaginary line,

each elongate bed generally lying between a pair of said furrows, said apparatus comprising

(a) a frame,

(b) a plurality of members carried on said frame and each shaped, contoured and dimensioned to track along one of said furrows in a direction of travel generally parallel to said imaginary horizontally oriented line;

(c) an assembly carried on said frame to cut a trench in one of said beds and dispensing tubing having an elongate

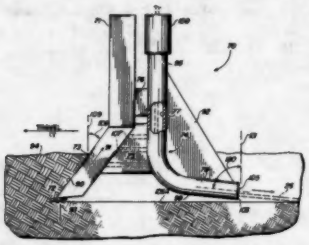
cross sectional area in said trench while said apparatus moves in said direction of travel, said assembly including

(i) a vertically disposed elongate blade assembly for cutting said trench, and

(ii) a tube dispensing member including

a generally vertically disposed top section, and

a sloped generally horizontally disposed elongate bottom section, said top and bottom sections having an inner



cylindrically shaped channel extending continuously therethrough, said bottom section including

an upper end connected to said top section of said tube dispensing member,

a lower end consisting of a tube dispensing mouth, and

a longitudinal axis extending through said inner cylindrically shaped channel thereof, said axis being at an angle to the vertical of less than 90°.

4,637,756

APPARATUS FOR REMOVING AND REPLACING PIPE BENEATH AN EARTHFILL

Flounoy W. Boles, P.O. Box 847, East Tallassee, Ala. 36023

Filed Jan. 23, 1985, Ser. No. 694,021

Int. Cl.[4] F16L *1/00*

U.S. Cl. 405—184 **15 Claims**

1. Apparatus for simultaneously removing and replacing a section of service tubing or pipe embedded in an earth fill, the apparatus being capable of removing and replacing service tubing or pipe of varying diameter, comprising:

a length of cable having a free end and an inner end;

an adapter member connected tothe inner end of the cable and being of a diameter less than that of the smallest diameter section of service tubing which is to be replaced;

a plurality of displacement members of substantially cylindrical conformation, each of said displacement members having a differing outer diameter which is greater than at least the inner diameter of the service tubing which is to be replaced by each said displacement member, the displacement members each being hollow to form a longitudinally disposed interior channel, each of said channels having an inner diameter which is greater than the outer diameter of the service tubing which is to be installed by each said displacement member, each of the displacement members having abutment surfaces on one end for abutting against the end of the section of service tubing which is to be replaced;

means on the adaptor means and on each of the displacement members for releasably connecting the adaptor member to the displacement member, each of the plurality of displacement members being connectible to the one adaptor member; and,

means carried by each of the displacement members for connecting a free end of the service tubing which is to be installed to the displacement member, whereby respective displacement members can be substituted for within the apparatus by ready and rapid disconnection of any one of the displacement members from the adaptor member and replacement on the adaptor member with a different sized displacement member to allow service tubing of different sizes to be removed and replaced.

4,637,757

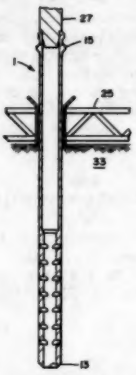
BARBED ANCHOR PILE

Paul M. Aagaard, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 12, 1984, Ser. No. 660,159

Int. Cl.[4] E02D *5/54, 5/74, 7/02*

U.S. Cl. 405—227 **4 Claims**



1. An anchor for an offshore platform comprising:

an anchor pile having a central axis along its length;

a plurality of movable barbs, each barb having a central axis along its length, said barbs located along the length of the pile, the axis of each movable barb being approximately 90° to the central axis of the pile, said barbs generally shaped like a rhombus having an inner surface and an outer surface, said inner surface facing upward and said outer surface facing downward; and

a spreader tool having a downward and inward sloping lower edge to engage the barbs so that when the tool is driven downward the barbs are forced outward by the contact between the downward and inward sloping lower edge and the barbs' upward facing inner surface.

4,637,758

METHOD OF DRIVING HOLLOW PILES INTO THE GROUND

Hiroaki Tamaki, Hiratsuka, and Joji Nakamura, Kamakura, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 357,270, Mar. 11, 1982, Pat. No. 4,494,613. This application Mar. 16, 1984, Ser. No. 576,995

Int. Cl.[4] E02D *7/24*

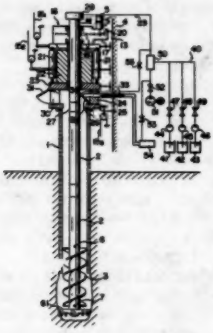
U.S. Cl. 405—248 **5 Claims**

1. A method of driving a hollow pile into the ground, comprising the steps of:

(a) inserting a hollow rod into the hollow pile, said hollow rod having a short auger fixedly secured to a leading end portion thereof and a cutter mounted to the leading end thereof;

(b) excavating the ground by the cutter and lifting excavated earth and sand to and around the upper portion of the short auger by rotating the same; and

(c) spouting highly pressurized air from a nozzle provided at a leading end portion of the hollow rod thereby lifting the excavated earth and sand to and beyond the upper end of



the hollow pile and discharging the same from above the hollow pile while continuously excavating the ground by the cutter thereby driving the hollow pile deep into the ground.

4,637,759

METHOD FOR FORMING A MOISTURE BARRIER IN A SOIL CONTAINING SOLUBLE SALTS

Yutaka Owa, Chiba; Yoshiro Tanaka, Ichikawa; Takeshi Saito, and Yoshiro Takeda, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,367

Claims priority, application Japan, Apr. 30, 1983, 58-77267

Int. Cl.[4] E02D *3/12*

U.S. Cl. 405—270 **5 Claims**

1. A method for forming a moisture barrier in a soil containing a soluble salt which comprises sprinkling a water-soluble polymer, or a combination of water-soluble polymers capable of being insolubilized by the interaction with the slat in the soil, over the soil, to form a water-impermeable layer in the soil underground, wherein the water-soluble polymer, or the combination of water-soluble polymers is selected from the group consisting of a copolymer of (A) acrylic acid and (B) acrylamide and/or N-vinyl-2-pyrrolidone, and a polymer composition of (C) polyacrylic acid and/or sulfated polysaccharide, and (D) a nonionic polymer solected from the group consisting of polyacrylamide, polyvinyl pyrrolidone, polyvinyl alcohol, hydroxyalkyl celluloses, hydroxyalkyl starches and guar gum.

4,637,760

APPARATUS FOR TRANSPORTING ARTICLES BY FLUID FLOW THROUGH A PIPE SYSTEM

Günther Boos, Markdorf, Fed. Rep. of Germany, assignor to Alfred Bolz GmbH & Co. KG, Wangen, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,759

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339362

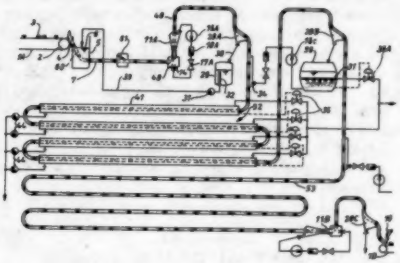
Int. Cl.[4] B65G *53/58, 53/14*

U.S. Cl. 406—105 **11 Claims**

1. Apparatus for transporting articles having a determined geometric shape from a starting location to an end location by fluid flowing through a pipe system, particularly packages containing said articles, and wherein said articles are treated during their transport, comprising in combination

first jet pump means of the Venturi type at a first location, said jet pump means including a suction chamber having a jet nozzle, an article inlet and a mixing outlet, diffusing means having an intake end of a predetermined cross-sectional area connected to said suction chamber, and a diffuser end having a drive fluid outlet of a certain cross-sectional area, and a transport fluid outlet, said predetermined cross-sectional area of said diffuser intake end widening in a generally hourglass and smooth manner devoid of any sharp transitions to said certain cross-sectional area of said diffuser end,

said first jet pump means further including feed-back means for connecting said drive fluid outlet to said jet nozzle, pumping means downstream of said drive fluid outlet, and regulating valve means downstream of said pumping means for connecting said drive fluid outlet to said jet nozzle, so that at least a portion of the drive fluid passing through said drive fluid outlet is returned to said diffuser means through said suction chamber,



guide means for guiding said articles from said mixing outlet through said diffusing means, said guide means including parallel bars spaced from one another so as to guide the articles therebetween at minimal resistance to fluid flow,

transport pipe means connected to said transport fluid outlet of said diffuser end, and extending to a second location,

injector means for injecting said drive fluid into said transport pipe means under pressure,

at least one additional jet pump means acting in opposition to said first jet pump means, so as to facilitate control of the pressure in said transport pipe means, and

suction pipe means for carrying said articles to said article inlet of said first jet pump means.

4,637,761

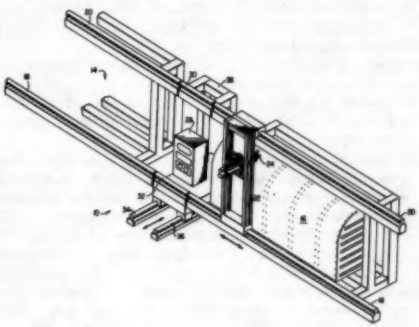
AUTOMATED TOOL POSITIONING SYSTEM

William J. Murray, Midlothian, and George A. Earle, III, Dallas, both of Tex., assignors to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Mar. 19, 1984, Ser. No. 590,905

Int. Cl.[4] B23B *49/00*; B23C *1/12*

U.S. Cl. 408—16 **3 Claims**



1. An automated tool positioning system comprising:

a plurality of work stations, each adapted to support a workpiece and having guide means disposed along one side thereof;

a single control device for generating tool position signals, said control device having guide means disposed along one side thereof;

means for selectively aligning said guide means of said single control device with said guide means of a selected one of said plurality of work stations comprising a guide rail disposed perpendicular to said guide means of said plurality of work stations wherein said single control device may be aligned adjacent to each of said plurality of work stations;

a tool support member movable along said guide means of a selected one of said plurality of work stations in response to said tool position signals for movably support and positioning a cutting tool in proximity to a selected surface on the selected workpiece, said cutting tool having a cutting implement mounted along the axis of said cutting tool with a cutting point extending outward therefrom; and

means for rotating said cutting tool through a conical section having its vertex at said cutting point to position said cutting implement normal to the selected surface on the workpiece.

4,637,762

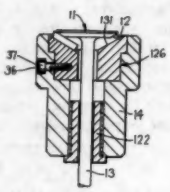
HAND-OPERATED VALVE REFACER

Franklin L. Acker, Owosso, Mich., assignor to Neway Manufacturing, Inc., Corunna, Mich.

Continuation of Ser. No. 793,495, Oct. 30, 1985, which is a continuation of Ser. No. 608,068, May 8, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 856,849

Int. Cl.[4] B24B *19/26*

U.S. Cl. 408—203.5 **11 Claims**



7. A tool for refacing the annular valve seat formed on the head of a poppet-type valve having an elongated stem projecting from the valve head, comprising:

a sleevelike and substantially cylindrical housing having a stepped bore extending axially therethrough, said stepped bore including a large-diameter bore portion which opens outwardly through one axially end of said housing, said large-diameter bore portion defining an inner annular shoulder on said housing;

a substantially cylindrical sleevelike support removably positioned within and substantially wholly occupying said large-diameter bore portion, said cylindrical support having an inner axial surface which substantially abuts said shoulder;

said cylindrical support having opening means extending coaxially therethrough in alignment and communication with said bore, said opening means including a truncated conical recess which opens inwardly from an outer axial end of said cylindrical support and converges as it projects axially therefrom for communication with a small-diameter opening which projects axially of said cylindrical support from an inner axial end thereof, said conical recess being defined by substantially truncated conical surface which opens inwardly of said one axial end, and said small-diameter opening having a diameter which is only a small fraction of the diameter of said truncated conical surface at the large diameter end thereof as defined at said outer axial end of said cylindrical support;

said cylindrical support being axially split so as to define at least three separable arcuate sectors each extending through an angle of substantially less than 180°, said sectors together effectively defining a complete sleevelike cylinder when positioned within the large-diameter bore portion of said housing;

movable securing means coacting between said housing and each said sector for permitting each said sector to be positioned within said large-diameter bore portion and fixedly but releasably secured to said housing;

each of said arcuate sectors having at least one blade-receiving groove formed in the conical surface thereof, said groove extending substantially radially of said conical surface so that the groove opens outwardly at the opposite ends thereof through the large- and small-diameter ends of the truncated conical surface; and

at least one elongated cutting blade fixedly but removably mounted within at least one of said grooves, said elongated blade extending substantially radially outwardly along said conical surface and having a cutting surface thereon which is spaced outwardly from said conical surface.

4,637,763

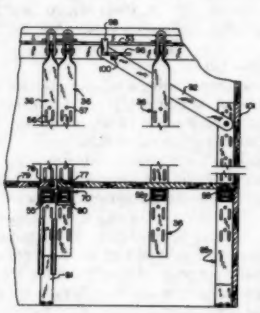
HANGING MULTI-DECK SYSTEM FOR STORING AND SHIPPING ARTICLES IN CONTAINERS

Willem H. P. Van Iperen, Westfield, N.J., assignor to Sea-Land Corporation, Elizabeth, N.J.

Filed Nov. 13, 1984, Ser. No. 670,494

Int. Cl.[4] B63B *25/18, 25/24*

U.S. Cl. 410—52 **15 Claims**



7. A removable multi-deck system for shipping non-stackable cargo in standardized intermodal containers, said containers having a floor, corner posts, and a pair of overhead extrusions extending between said corner posts, said extrusions having a pair of inwardly extending longitudinal ledges adjacent a roof, said system comprising;

(a) a plurality of removable vertical support hangers, each hanger having a first and a second end,

(b) the first end of each hanger having a releasable ledge engaging means for gripping the inwardly extending ledge adjacent the roof of the intermodal container,

(c) the second end hanging freely to thereby suspend all of the load carried by the hanger from the horizontal ledge of the extrusion,

(d) a plurality of horizontal support means extending between opposing pairs of removable vertical hangers and secured thereto, to thereby provide horizontal support for non-stackable cargo,

whereby said removable hangers and support means may be adjustably spaced along the longitudinal and vertical dimensions of the container, and quickly and easily removed to allow

the entire cross-section of the container to be filled with bulk goods.

4,637,764

BOLT ADAPTED FOR ONE-HANDED TIGHTENING BY TIGHTENING TOOL

Yoshio Imai, Abiko, Japan, assignor to Nissan Motor Company, Limited, Yokohama and Sannohashi Seisakusho Company, Limited, Tokyo, both of, Japan

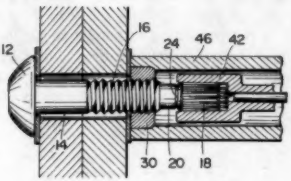
PCT NO PCT/JP83/00089, § 371 Date Nov. 23, 1983, § 102(e) Date Nov. 23, 1983, PCT PUB No. WO83/03451 PCT PUB. Date Oct. 13, 1983

PCT filed Mar. 24, 1983, Ser. No. 557,184

Claims priority, application Japan, Mar. 24, 1982, 57-40340

Int. Cl.⁴ F16B *31/00*

U.S. Cl. 411—5 **21 Claims**



1. A fastener adapted to be tightened from one side by means of a tightening tool having an inner socket for gripping a one-handed tightening bolt to prevent the bolt from rotating and an outer socket for applying a rotational force to a nut to tighten the nut to the bolt,

the one-handed tightening bolt comprising:

a threaded portion engaging an internally threaded nut and extending from a position adjacent a bolt head, said nut having a thickness equal to or greater than the diameter of said bolt;

a grip portion to be gripped by an inner socket of a tightening tool for preventing rotation, said grip portion being located adjacent the end of said bolt remote from said bolt head;

a non-threaded, cylindrical guide section interpositioned between said threaded portion and said grip portion and having a given length, whereby approximately the entire length of the grip portion protrudes from the nut when the nut is preliminarily attached with about one-to-two turns of tightening rotation; and

means, formed on said guide section between said threaded portion and said grip portion, for shearing when the tightening torque of the nut reaches a predetermined value in order to hold the nut tightening torque to the predetermined value, said shearing means being located at the end of said guide section adjacent said grip portion.

4,637,765

TWO-PIECE EXPANDABLE PLASTIC RIVET

Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

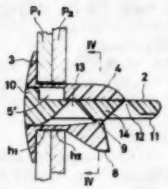
Filed Jul. 15, 1985, Ser. No. 755,032

Claims priority, application Japan, Jul. 18, 1984, 59-107638[U]

Int. Cl.⁴ F16B *13/04, 13/06*

U.S. Cl. 411—41 **4 Claims**

1. A plastic rivet consisting of rivet body comprised of a flanged head and a leg member extending from the bottom of the head and having a tip remote from said head, the rivet body having an axial hole extending through its entire length, and a rotationally asymmetric pin which when inserted into the through-hole of the rivet body expands the leg member, characterized in that the through-hole has a large-diameter portion extending from the head of the rivet body to an intermediate portion of the leg member, a shoulder being formed between the large-diameter portion and the remainder of the through-hole, the leg member being formed to have a single movable leg by providing two off-center slits opening axially outwardly at said tip and running axially inward from the tip of the leg member, said slits communicating with the through-hole, the movable leg being provided on its inner surface with a tooth-like protuberance extending transversely substantially completely across said through-hole, the pin having a shank portion having a transverse dimension and being provided on one end with a head capable of entering the large-diameter portion of the through-hole, the shank of the pin being provided with two V-shaped recesses spaced in the axial direction of the pin and each having a depth substantially equal to said transverse dimension of said pin to leave a tooth-like protuberance therebetween having a height substantially at least as great as said transverse dimension of said pin, and the tip of the tooth-like protuberance of the pin being provided with a shallow notch,



whereby when the pin is inserted into the through-hole from the head end of the rivet body to the point that the protuberance on the movable leg engages with the first recess, the head of the pin is at a position outward from the outer surface of the head of the rivet body, when the head of the pin is pressed further inward to bring its outer surface flush with the outer surface of the head of the rivet body, the notch provided on the protuberance on the shank coming into engagement with the top of the protuberance on the movable leg and causing the movable leg to be deflected outwardly to increase the effective diameter of the leg member, and when the head of the pin is pressed inward still further to cause it to enter the large-diameter portion to the point where it strikes against the shoulder, the protuberance on the movable leg engaging with the second recess allowing the movable leg to close and reduce the effective diameter of the leg member.

4,637,766

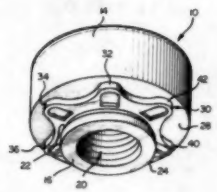
CLINCH TYPE FASTENER

John Milliser, Rochester, Ind., assignor to Textron Inc., Providence, R.I.

Filed Jun. 17, 1985, Ser. No. 745,623

Int. Cl.⁴ F16B *37/04*

U.S. Cl. 411—180 **7 Claims**



1. A self-clinching fastener of the type for connection to a section of sheet material, said fastneer including a head and a shank portion, with a groove formed in said shank portion, with said head including a material deforming portion embeddable ins aid sheet material to displace material thereof into said groove to form a mechanical interlock between said sheet material and said fastener, and said material deforming portion

includng a plurality of radially disposed projections extending axially outward of an undersurface of said head and intermediate said undersurface and said groove, each said projection including an axially facing discrete recess formed therein, a convexed peripheral portion of each said radial projection and a wall portion of said recess associated with said radial projection being defined by a raised ridge on the undersurface of said head, said recess being disposed inwardly of the periphery of said projection and intermediate said periphery and the shank portion, such that the material of the workpiece being displaced will flow into said groove and into the recesses in said projections, with the radial projections and the wall portions of the recesses locking the fastener against rotative movement, and with the material flowing into said groove locking the fastener against axial movement, and the location of said recess assuring complete formation of the projectios during fabrication.

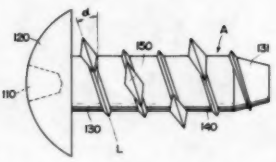
5. In combination, a section of apertured sheet material and a threaded self-clinching fastener engaged therewith, said fastener including a head and a shank portion, with a groove formed in said shank portion, said head including a material deforming portion embeddable in said sheet material to displace material therefrom into said groove to form a mechancial interlock between said sheet material and said fastener, said shank further including an extruding section of a diameter greater than the initial diameter of the aperture formed in said sheet material, such that upon engagement of said fastener with said sheet material, said extruding section will resize said initial aperture preparatory to the seating of said head, said material deforming portion including a plurality of radially disposed projections extending axially outward of the undersurface of said head and intermediate said undersurface and said peripheral groove, each said projection including an axially facing recess formed therein, a convex peripheral portion of each said radial projection and a wall portion of the recess associated with each projection being defined by a raised ridge on the undersurface of said head, said recess being disposed inwardly of the periphery of said projection and intermediate said projectio periphery and the shank portion, said recesses assuring complete formation of the projections during fabrication, and also allowing the material of the workpiece being displaced upon embedding of said material deforming portion in said workpiece to flow into said groove to lock the fastener against axial movement, said material flowing into the recesses in said projections, with the radial projections and the wall portions of the recesses looking the fastener against rotative movement.

4,637,767

THREADED FASTENER

Kouichi Yaotani, Akikawa; Fumio Nakada, Hatano; Takso Tanaka, Hino, and Minoru Yoshida, Hachiouji, all of Japan, assignors to Topura Co., Ltd., Osaka, Japan

Continuation of Ser. No. 332,835, Dec. 21, 1981, abandoned. This application Dec. 28, 1984, Ser. No. 685,620
Claims priority, application Japan, Dec. 26, 1980, 55-187479
Int. Cl.[4] F16B *35/04*
U.S. Cl. 411—411 **13 Claims**



1. In a threaded fastener of the self-tapping screw type for fastening workpieces made of resilient elastic material having fastener receiving holes preformed therein, the fastener having a shank, a tip end and a head on the shank, and a uniform height helical screw thread on the shank having an appropriate lead angle, and a means on the head to facilitate rotating and driving said fastener, the improvement comprising:

a screw thread having a maximum thread diameter smaller than the diameter of the preformed hole, and smaller than the maximum diameter of the standard screw thread of a standard screw of the same size;

a plurality of screw thread type projections disposed in spaced relationship on said screw thread along the full length of the shank except the tip end thereof and having the same lead angle as said screw thread; and

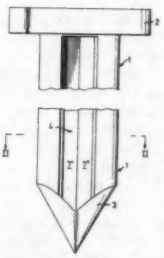
said uniform height screw thread and said screw thread type projections having similar cross-sectional shapes, and said screw thread type projections each having a length shorter than half of the circumference of the shank, and having a crest surface having one end starting from the crest surface of said uniform height screw thread and gradually increasing in the lead direction and forming an enlarged slope surface ending at a thread tip on the crest surface of the projection of maximum height, the width and height thereof in the lead direction from said thread tip gradually decreasing and forming a reduced slope surface with said crest surface of the projection ending at the other end thereof at the crest surface of the uniform height screw thread.

4,637,768

NAIL-TYPE FASTENER, AND PROCESS FOR MANUFACTURING SUCH FASTENERS

Karl L. G. Rabe, Björnbärsvägen 35, S-69147 Karlskoga, Sweden

PCT No. PCT/SE82/00293, § 371 Date May 25, 1983, § 102(e) Date May 25, 1983, PCT Pub. No. WO83/01097, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 23, 1982, Ser. No. 504,686
Claims priority, application Sweden, Sep. 28, 1981, 8105713
Int. Cl.[4] F16B *15/08*
U.S. Cl. 411—452 **7 Claims**

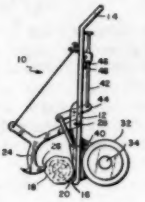


1. A nail type fastener, comprising a straight elongated shank, the lateral surface of which comprises three separate lateral surfaces, there being at one end of the shank a head, while the other end of the shank has a point, characterized in that in each of said lateral surfaces a groove is made extending along the shank, said groove being defined transversely by two opposing side flank surfaces both of which connect via individual corners which are preferably sharp or of small radius, to the groove bottom surface which is, in section, a V-shaped bottom surface (7), the flat halves (7', 7'') of which form an obtuse angle (δ) with each other, suitably an angle of 130 degrees to 170 degrees, preferably about 150 degrees, and that the lateral surfaces of the shank which are provided with grooves are separated from each other transversely by ridges running along the shank, with arcuate crosssectional outer contours.

4,637,769
LOG CARRIER

Charles E. Thorndike, P.O. Box 446, Meredith, N.H. 03253

Filed Feb. 4, 1985, Ser. No. 698,110
Int. Cl.[4] B65G 7/12
U.S. Cl. 414—454 11 Claims



1. A carrying apparatus for lifting and transporting a load comprising:

(A) a frame having a handle extending upwards, and a support surface on one face of the frame upon which the load is held;

(B) a wheel assembly attached at one end of the frame for transporting the carrier and the load;

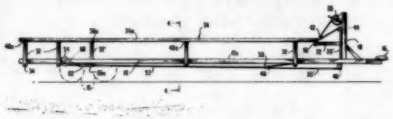
(C) a hook having at one end a seizing means directed towards said support surface, and at an opposite end a hinged attachment to the frame at a point above the support surface such that the hook can swing generally away from the support surface and upward; and

(D) a load stabilizer movably attached to the frame for applying a force on the load generally downward and outward from said support surface, so that said load is securely restrained by said hook seizing means.

4,637,770
SELF-EQUALIZING LIFTING TRAILER

Robert A. Swadell, 1530 Palomino Dr., Henderson, Nev. 89015

Filed Sep. 17, 1985, Ser. No. 776,933
Int. Cl.[4] B60P 3/10
U.S. Cl. 414—495 3 Claims



1. A trailer frame apparatus, particularly intended for use with pontoon boats, catamarans and the like, and comprising:

(a) an elongate lower frame (10),

(b) an elongate upper frame (24),

(c) a plurality of spaced coupling arms (32) individually and pivotally connected at opposite ends thereof between the upper and lower frames to define therewith a parallelogram configuration with the upper frame longitudinally and transversely displaceable with respect to the lower frame in a pivotal mode,

(d) a winch (20) mounted on the lower frame proximate a forward end thereof and at an elevated, or the same, height relative to a raised, uppermost position of the upper frame,

(e) drum means rotatably mounted on the lower frame proximate a rear end thereof,

(f) bell crank means (60), pivotally mounted at an elbow portion thereof on the lower frame proximate the rear end thereof, for applying a lifting force to the rear end of said upper frame, and comprising angled first and second arms (62, 32'), the second arm (32') being connected at a distal end thereof to the upper frame,

(g) a first pulley (42) fixed to the forward end of said upper frame,

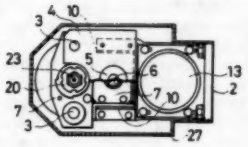
(h) cable means (20') for transferring a lifting force to the rear and forward ends of said upper frame, and having one end wound around said winch, said cable means passing around said pulley and said drum means and having its other end fixed to said first arm (62) of said bell crank means,

whereby, with a load supported on the upper frame in a lowered position thereof, tension applied by said winch to said cable means to raise the upper frame will initially exert more lifting force on the rear end of said upper frame than on the front end, and, in an inherently automatic and transitional manner, will exert more lifting force on the front end of said upper frame as it is raised to said upper most position.

4,637,771
LIFTING HEAD OF SWIVEL ARM OF ASSEMBLY ROBOT

Kazuyoshi Yasukawa, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Mar. 11, 1985, Ser. No. 710,268
Claims priority, application Japan, Mar. 12, 1984, 59-34131[U]
Int. Cl.[4] B25J 15/00
U.S. Cl. 414—590 8 Claims



1. A lifting head of a swivel arm of an assembly robot comprising:

a pair of guide bars fixedly provided on said swivel arm and extending in parallel;

a feed screw rotatably supported on said swivel arm in such a manner that said feed screw extends parallel to said guide bars;

a nut member engaging said feed screw;

a holding plate fixedly secured to an upper side of said swivel arm;

a supporting member fixedly secured to an upper end of said holding plate, said supporting member fixedly supporting upper end portions of said guide bars and rotatably supporting upper end portions of said feed screw;

a cylindrical guide having an inner wall of noncircular section, said cylindrical guide being rotatably supported by said swivel arm;

a lifting shaft slidably inserted into said cylindrical guide, said lifting shaft having an upper end portion rotatably supported by said nut member for vertical movement therewith and having a fluid passage formed therein, an upper end of which is coupled to a fluid pipe;

a rotating pulley provided at a lower end of said cylindrical guide; and

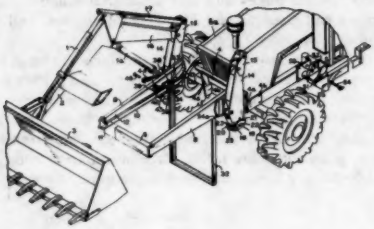
a cover fixedly secured to said swivel arm and covering said guide bars and said feed screw, said cover comprising a pair of guide rollers and having a hole at a top thereof, said guide rollers being supported on both sides of said hole and said pipe extending through said hole and being guided by said guide rollers.

4,637,772

LOADER MOUNT

Leroy Stumpe, Hartford, S. Dak., assignor to Du-Al Manufacturing Company, Sioux Falls, S. Dak.

Filed Sep. 12, 1984, Ser. No. 649,686
Int. Cl.[4] E02F 3/62
U.S. Cl. 414—686 8 Claims



6. A mount for disconnectably attaching an appliance such as a loader on the front end of a tractor comprising in combination:

a loader mounting frame having a rear side attachment insertion structure at each side;

a receiving member for being secured on each side of a tractor;

camming means having coacting mating surfaces on said receiving member and on said insertion structure for camming the insertion structure to a home position as it is moved rearwardly;

locking means applying a rearwardly directed force to the insertion structure holding the mating surfaces in said home position;

a forward attachment structure on the frame;

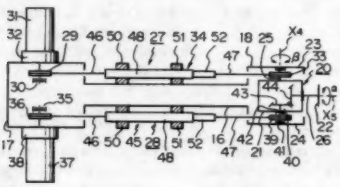
and a mating forward attachment structure for mounting on a tractor; one of said forward attachment structures including horizontally extending channels at each side of the tractor and the other of said structures including pins for mounting on the tractor to be received by the channels and to slide a distance in the channels determined by the location of said home position.

4,637,773

INDUSTRIAL ROBOT OF THE ARTICULATED ARM TYPE

Seiichiro Nakashima; Kenichi Toyoda, both of Hino; Nobutoshi Torii, Hachioji, and Ryo Nihei, Musashino, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP84/00218, § 371 Date Dec. 31, 1984, § 102(e) Date Dec. 31, 1984, PCT Pub. No. WO84/04269, PCT Pub. Date Nov. 8, 1984
PCT Filed Apr. 27, 1984, Ser. No. 691,301
Claims priority, application Japan, Apr. 30, 1983, 58-74955
Int. Cl.[4] B25J 9/00
U.S. Cl. 414—732 4 Claims



1. An industrial robot of the articulated arm type comprising:

a movable robot body arranged on a base;

an upper arm having root and tip portions and rotatably pivoted to said robot body at said root portion;

a forearm having rear and front ends and rotatably pivoted to said tip portion of said upper arm at a portion between said rear and front ends;

a wrist assembly arranged on said front end of said forearm and rotatable in relation to said front end about at least one axis; and

at least one wrist device unit for driving said wrist assembly and rotating it about said axis, said wrist drive unit including a first sprocket which is rotatably arranged in said rear end of said forearm, a drive motor arranged on said rear end of said forearm and coupled with said first sprocket to rotate it, a second sprocket arranged in said front end of said forearm and operatively coupled with said wrist assembly, and a wrapping connector for transmitting rotational movement of said first sprocket to said second sprocket;

said wrapping connecting including a first chain meshing with said first sprocket, a second chain meshing with said second sprocket, a pair of rods connecting the two ends of said first chain to the two ends of said second chain, respectively, and means for absorbing elongation of said first and second chains;

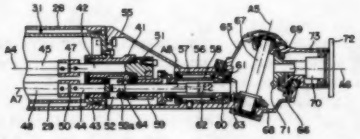
said means for absorbing elongation of said first and second chains including at least one tensioner interposed between at least one of said rods and at least one of said chains for providing a constant tensile force to said chains, said at least one tensioner comprising a cylindrical member connected to said at least one of said rods, a rod member connected to said at least one of said chains, a rod guide adjustable mounted in said cylindrical member, said rod member extending through said rod guide and having one end in said cylindrical member, and a plurality of coned disc springs surrounding said rod member interposed in a compressed state between said one end of said rod member and said rod guide.

4,637,774

INDUSTRIAL ROBOT

Hiroshi Nakamura; Osamu Toyama, both of Kariya, and Norikszu Kanii, Chita, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 13, 1985, Ser. No. 701,305
Claims priority, application Japan, Feb. 29, 1984, 59-39525; Mar. 1, 1984, 59-39832; Mar. 6, 1984, 59-43396
Int. Cl.[4] B25J 9/00
U.S. Cl. 414—735 8 Claims



1. An industrial robot comprising:

(a) an arm body (25);

(b) a rotary member (31) carried on said arm body (25) for rotation about a first axis (A4);

(c) a twist body (55) secured to one axial end of said rotary member (31);

(d) a bend body (65) carried by said twist body (55) for rotation about a second axis (A5) which is slanted with respect to said first axis (A4);

(e) a swivel body (73) carried by said bend body (65) and comprising a swivel shaft (70), said swivel shaft (70) rotating about a third axis (A6) which is slanted with respect to said second axis (A5);

(f) a first shaft (62) carried in said twist body (55) and rotat-

able about a fourth axis (A7) parallel to and eccentrically spaced (E1) with respect to said first axis (A4) for transmitting driving power to said swivel body (73);

(g) a second shaft (58) carried in said twist body (55) and rotatable about a fifth axis (A8) parallel to and eccentrically spaced (E2) with respect to said fourth axis (A7) for transmitting driving power to said bend body (65);

(h) a third shaft (35) rotatably carried by said rotary member (31) for rotating said first shaft (62); and

(i) a fourth shaft (34) rotatably carried by said rotary member (31) for rotating said second shaft (58), said fourth shaft (34) being coaxial with and rotatable about said first axis (A4).

4,637,775

INDUSTRIAL ROBOT DEVICE

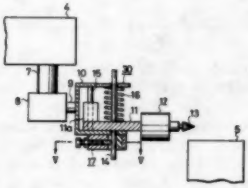
Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 12, 1984, Ser. No. 680,726

Claims priority, application Japan, Dec. 15, 1983, 235137

Int. Cl.⁴ B25J *11/00*

U.S. Cl. 414—744 R **12 Claims**



1. An industrial robot device in which a work tool such as a cutting or a grinding tool is mounted at a forward end of an arm, said device comprising:

(a) a support frame for supporting said work tool;

(b) means provided on said support frame for supporting said work tool displaceably relative to said support frame, said supporting means comprising an elastic member for applying an elastic force in a predetermined direction to said work tool and a displaceable member movable with said work tool; and

(c) a friction damper comprising a pair of friction members sandwiching said displaceable member therebetween, said friction damper being provided on said support frame for exerting a damping force on said displaceable member, said damping force preventing sudden displacement of said work tool by an external force and by said elastic force.

4,637,776

RETAINING STRUCTURE FOR SCREW FASTENING UNIT IN AN ARTICULATED ROBOT

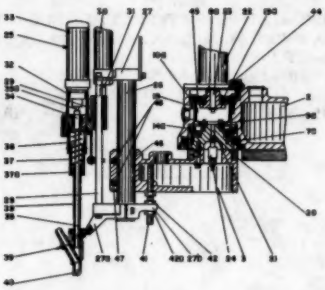
Masayuki Saito, Kyoto, Japan, assignor to Nitto Seiko Co., Ltd., Kyoto, Japan

Filed Jul. 24, 1985, Ser. No. 759,069

Int. Cl.⁴ B25J *15/06*

U.S. Cl. 414—744 B **1 Claim**

1. An articulated robot including a first arm, a second arm which is mounted on said first arm, controlled by motors, respectively, and an end tool unit slidably fixed to the top of the secondary arm by means of a stud bolt and nuts to be mated with it, wherein said secondary arm has an end portion which forms a vertical through hole in which a vertical rod is slidably secured at a predetermined position by lock bolts, said end tool unit is secured to the vertical rod by means of an upper bracket and a lower bracket, said lower bracket being compressed by said pair of stop nuts to be mated with an adjustable stud bolt which is fixed to bottom of the secondary arm parallel to said vertical rod, whereby the height of the top of the end tool unit



for different work pieces can be changed without changing the height of the arms from a supporting base.

4,637,777

MANIPULATOR HAVING SIX DEGREES OF FREEDOM

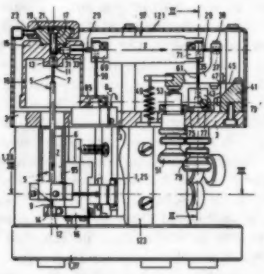
Hendricus F. G. Smulders, Eindhoven; Adrianus J. J. Franken, Maarheeze; Johannes W. Faber, and Wouter H. Swinkels, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1984, Ser. No. 671,256

Claims priority, application Netherlands, Sep. 11, 1984, 8402765

Int. Cl.⁴ B65G *35/00*

U.S. Cl. 414—751 **4 Claims**



1. A manipulator comprising:

a frame;

six driving members, all six driving members being directly connected to the frame;

six coupling members having first and second opposite ends, the first end of each coupling member being connected to an associated driving member; and

an object holder supported with respect to the frame by the second ends of the coupling members;

characterized in that:

three driving members are arranged to displace the object holder in three substantially orthogonal directions of translation with respect to the frame, each translational driving member and its associated coupling member being identical to each other translational driving member and its associated coupling member; and

the remaining three driving members are arranged to rotate the object holder in three substantially orthogonal directions of rotation with respect to the frame, each rotational driving member and its associated coupling member being

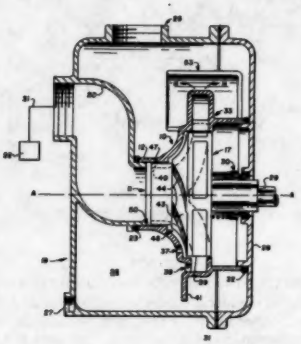
identical to each other rotational driving member and its associated coupling member.

4,637,778

SELF-PRIMING DIFFUSER TYPE CENTRIFUGAL PUMP

Theodore J. Pollari, Ft. Mill, N.C., assignor to Textron Inc., Providence, R.I.

Filed Dec. 12, 1983, Ser. No. 560,502
Int. Cl.[4] F04D 5/00
U.S. Cl. 415—53 R 10 Claims



1. A self-priming centrifugal pump comprising:
a housing having an inlet and an outlet;
an impeller mounted for rotation about a generally horizontal axis of rotation, and within said housing;
means defining a liquid reservoir adjacent said housing and in operative association with said impeller, said liquid reservoir separated from said housing liquid inlet so that no operative communication between said reservoir and said inlet is provided, and said reservoir is in operative communication with an outlet from said housing;
means defining at least one liquid-circulating valveless port in said housing adjacent said impeller for providing effective recirculation of liquid from said liquid reservoir to said impeller for successful priming of said pump; and
air shield means disposed between a housing outlet and said recirculating ports below said axis of rotation, and for preventing air discharge from said housing outlet from passing to said liquid recirculating ports, so that air laden water is kept separate from the liquid in said reservoir wherein said impeller includes a front shroud at a portion thereof closest to said housing inlet; and further comprising external vane means disposed on said impeller front shroud for effecting separation of air flowing with liquid through said housing inlet, and for effecting circulation of liquid from said liquid reservoir through said valveless port.

4,637,779

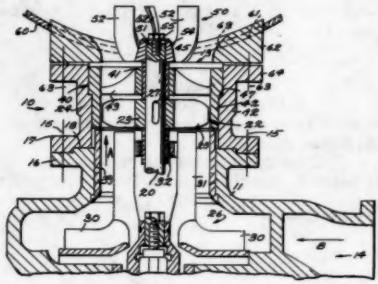
TWO STAGE MEDIUM CONSISTENCY PULP PUMPING

Michael I. Sherman, Glens Falls, N.Y., and Stefan Golston, Bellevue, Wash., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed May 17, 1985, Ser. No. 735,350
Int. Cl.[4] F04D 1/10
U.S. Cl. 415—143 21 Claims

1. A method of pumping a suspension having a consistency between about 6-20%, comprising the step of continuously acting upon a suspension to progressively
(a) effect initial fluidization of the suspension;
(b) effect removal of extreme pre-rotation of the fluidized suspension, and define a definite directional flow angle of the suspension;
(c) effect a first fluidizing pumping of the suspension, in a first stage, to pump the suspension directly to a second stage; and
(d) effect a second fluidizing centrifugal pumping of the suspension in the second stage.

7. A centrifugal pump for fluent material comprising:
a housing having an inlet and an outlet;
a shaft mounted for rotation within said housing about an axis of rotation;
a first set of vanes mounted to said shaft within said housing adjacent said inlet;



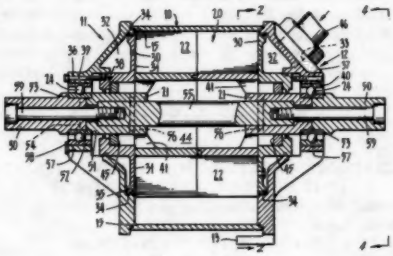
a second set of vanes mounted to said shaft within said housing between said first set of vanes and said outlet;
a third set of vanes stationarily mounted to said housing between said inlet and said first set of vanes, said third set of vanes comprising means for removing extreme prerotation of fluent material passing therethrough; and
means for effecting rotation of said shaft and said first and second sets of vanes with respect to said housing.

4,637,780

WATER RING VACUUM PUMP HAVING ADJUSTABLE PART PLATES AND A HOLLOW IMPELLER

Paul A. Grayden, Wantirna South, Australia, assignor to Prescant Pty. Limited, Australia

Filed May 14, 1985, Ser. No. 733,861
Claims priority, application Australia, May 14, 1984, PG4969
Int. Cl.[4] F04C 19/00
U.S. Cl. 417—68 8 Claims



1. A water ring pump including:
(a) a body;
(b) end members on the body;
(c) an impeller in the body and having a shaft extending through the end members;
(d) the impeller shaft extending through the end members being journalled for rotation therein;
(e) an inlet in one end member;
(f) an outlet in the other end member;
(g) a pump being characterized in that the impeller has a shaft member extending outwardly from each end thereof,

each of which shaft members is located in the inner race of a bearing, a stub shaft fastened to each impeller shaft member within the inner race and being in driving connection therewith, and wherein the impeller has a bore therethrough and a spider or the like connected to each end of the impeller, each of which spiders has a shaft member extending therefrom.

3. A water ring vacuum pump having:

(a) a body;

(b) end members on the body;

(c) an impeller in the body and having a shaft extending through the end members;

(d) the impeller shaft extending through the end members being journalled for rotation therein;

(e) an inlet in one end member;

(f) an outlet in the other end member;

(g) a port plate located in each end member and being located adjacent the blades of the impeller whereby a manifold is formed between each port plate and its adjacent end member, the port plate adjacent the inlet end having an inlet port and the port plate adjacent the outlet end having an outlet port;

(h) the pump being characterized in that each port plate is moveable relative to its adjacent end member by screws or the like passing through the end member, which screws abut the face of the port plate and can act to cause its location against the impeller, and locking means passing through the end member and into threads in the port plate whereby the port plate can be moved away from the impeller, the said locking means, when the impeller is correctly positioned, acting against the screws or the like which abut the port plate, thus serving to lock the port plate in position.

4,637,781

TORQUE REGULATING SYSTEM FOR FLUID OPERATED PUMP DISPLACEMENT CONTROL SYSTEMS

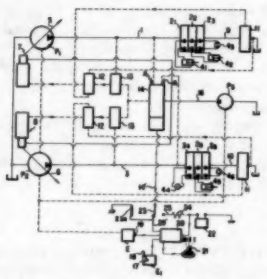
Teruo Akiyama, Yokohama; Katsuyuki Sasaki, Kyoto, and Takaichi Saigo, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,197

Claims priority, application Japan, Mar. 30, 1984, 59-060841; Nov. 30, 1984, 59-251992

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—216 **2 Claims**



1. A fluid operated pump displacement control system comprising a control means connected to respective displacement control devices of variable displacement pumps and adapted to be operated by discharge pressure fluid from a discrete control pump, said control means including neutral control valve means, cut-off valve means and jet sensor means, a variable torque control valve having a proportional electromagnetic solenoid provided in a circuit connecting said control means with said control pump and adapted to operate pressure reduction by a discharge fluid pressure of said variable displacement pumps and a propelling force of said proportional electromagnetic solenoid, electronic means for detecting set output conditions of a prime mover for driving said variable displacement pumps, and means for supplying current to said proportional electromagnetic solenoid according to the difference between a set reference rotational speed in each of said set output conditions and an actual rotational speed of said prime mover.

4,637,782

ROTARY VANE PUMP

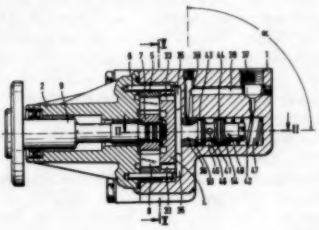
Heinz Teubler, Friedrichsdorf, and Rene Schulz, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Vickers Systems GmbH, Bad Homburg, Fed. Rep. of Germany

Continuation of Ser. No. 696,268, Jan. 30, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,254

Claims priority, application European Pat. Off., Feb. 4, 1984, 84101136.4

Int. Cl.[4] F04B *49/02*

U.S. Cl. 417—300 **7 Claims**



1. A pump comprising:

a casing having a hollow therein;

a fluid supply system including in said casing an inlet port and inlet opening means communicating with said hollow;

a fluid discharge system including outlet opening means from said hollow and an outlet port in said casing;

fluid displacement means arranged in said hollow and adapted to displace fluid from said supply system into said discharge system to form a flow of displaced fluid;

a flow control valve arranged between said fluid supply system and said fluid discharge system and adapted to by-pass fluid from said discharge system into said supply system so as to leave a desired flow within said discharge system between said flow control valve and said outlet port, said flow control valve comprising a housing means having passage means including an orifice, a spool having a pressure area to open said by-pass and a pressure area to close said by-pass, and a valve spring biasing said spool in a direction to close said by-pass;

said orifice having an upstream and a downstream side, and said upstream side being connected to said by-pass-opening pressure area and said downstream side being connected to said by-pass-closing pressure area; and

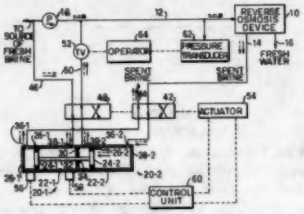
a venturi throat included in said fluid discharge system and having walls so as to receive all said displaced flow, said orifice being formed as a transverse opening in said walls of said venturi throat and said orifice conducting said desired flow to said outlet port, said venturi throat being disposed substantially coaxially with respect to said spool and being of a width at its downstream end which is substantially equal to the diameter of the spool.

4,637,783

FLUID MOTOR-PUMPING APPARATUS AND METHOD FOR ENERGY RECOVERY

Gerry B. Andeen, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 20, 1980, Ser. No. 198,716
Int. Cl.[4] F04B 9/08
U.S. Cl. 417—318 20 Claims



1. In a method of delivering fresh brine to a reverse osmosis device by use of main pump means and a plurality of interconnected motor-pump means using spent brine from the reverse osmosis device as motive fluid for said motor-pump means, each motor-pump means including a closed cylinder with a reciprocably movable piston therein separating the cylinder into motor and pump chambers, each piston having opposite faces of different effective area with the larger piston face being included in the motor chamber and the smaller face in the pump chamber for pressure amplification, said pistons being interconnected for simultaneous movement thereof, said method comprising

sequentially supplying spent brine from the reverse osmosis device, through non-pressure-increasing means, to the motor chambers for piston movement from start to end positions while simultaneously sequentially pumping fresh brine from the associated pump chambers, through non-pressure-increasing means, to the inlet of the reverse osmosis device for supplying the reverse osmosis device with a first quantity of fresh brine for desalination,

sequentially supplying fresh brine to the pump chambers while simultaneously sequentially dumping spent brine from the associated motor chambers during return piston movement from end to start positions, and

through said main pump means, supplying the reverse osmosis device with a second quantity of fresh brine for desalination.

4,637,784

METERING PUMP WITH DIAPHRAGM

Alden A. Lofquist, Jr., 10609 Farragut Hills Blvd., Knoxville, Tenn. 37922

Filed Oct. 15, 1985, Ser. No. 787,499
Int. Cl.[4] F04B 19/14; F01D 23/00; F03B 9/00
U.S. Cl. 417—320 13 Claims

1. An apparatus for metering small volumes of fluid, comprising:

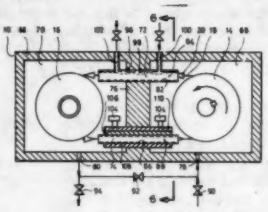
a pump housing having a first fluid space and a second fluid space, and a wall separating said first fluid space from said second fluid space;

an inlet opening for passing fluid into said first fluid space;

an outlet opening for delivering fluid from said second fluid space;

first pump means located in said wall for pumping fluid from said first fluid space to said second fluid space; and

second pump means located in said wall for pumping fluid from said second fluid space to said first fluid space at a slower rate than said first pump means is pumping fluid from said first fluid space to said second fluid space so that said second fluid space is pressurized relative to said first fluid space, whereby fluid flows through said outlet opening out of said second fluid space and through said inlet opening into said first fluid space.

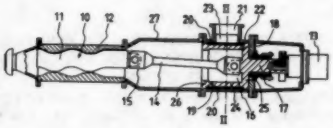


4,637,785

ROTARY PUMP WITH CUTTER DEVICE FOR CONTAMINATED FLUIDS

Hans Bäckström, Rymdvägsgatan 14, Västra Frölunda, Sweden (421 33)

PCT No. PCT/SE84/00298, § 371 Date May 14, 1985, § 102(e) Date May 14, 1985, PCT Pub. No. WO85/01327, PCT Pub. Date Mar. 28, 1985
PCT Filed Sep. 13, 1984, Ser. No. 733,764
Claims priority, application Sweden, Sep. 16, 1983, 8304985
Int. Cl.[4] F04C 2/107, 15/00; B02C 18/06
U.S. Cl. 418—48 2 Claims



1. A rotary pump for contaminated fluids comprising:

an elongate housing having first and second ends;

an orbiting rotary displacement pump at said first end;

a driving motor having a drive shaft at said second end;

at least one radially directed inlet to said housing, adjacent to said second end;

a hollow drum having an end wall and a cylindrical side wall provided with axial openings and located within said housing inside said radial inlet;

edge steels defining said openings in the side wall of said drum and at least one counter cutting edge at said at least one radial inlet; and

means for connecting said drum end wall concentrically with the drive shaft of said motor, as well as a universal connection means passing from said end wall, through said drum to said displacement pump for driving the same.

4,637,786

SCROLL TYPE FLUID APPARATUS WITH LUBRICATION OF ROTATION PREVENTING MECHANISM AND THRUST BEARING

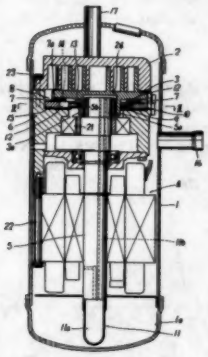
Yoshiaki Matoba, and Hitoshi Ozawa, both of Sakai, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

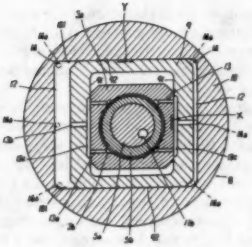
Filed Jun. 17, 1985, Ser. No. 745,227
Claims priority, application Japan, Jun. 20, 1984, 59-127184; Jun. 23, 1984, 59-93973[U]; Jun. 23, 1984, 59-93974[U]; Apr. 10, 1985, 60-76108
Int. Cl.[4] F01C 1/04, 21/04; F16D 3/04; F16N 1/00
U.S. Cl. 418—55 7 Claims

1. A scroll type fluid apparatus provided with a fixed scroll, an orbiting scroll, a housing for fixing said fixed scroll, a thrust

bearing for supporting said orbiting scroll rotatably to said housing, a crankshaft having an eccentric shaft for driving said orbiting scroll, and a rotation preventing mechanism for preventing said orbiting scroll from rotating by itself,

said rotation preventing mechanism comprising a bearing portion provided at the rear side of said orbiting scroll, having a receiving portion for receiving therein said eccentric shaft, and formed to be square at the outer surface; a sliding member having inner surfaces engageable with two opposite outer surfaces at said bearing portion to regulate radial movement of said bearing portion in reciprocating movement, and formed to be square at the outer surface; and a holder for said sliding member, which has inner surfaces engageable with two opposite outer surfaces at said sliding member in the direction perpendicular to said moving direction of said bearing portion; said crankshaft being provided with lubrication means for lubricating said bearing portion, said rotation preventing mechanism being provided before and behind said sliding member in the sliding direction thereof with oil chambers tightly sealed and variable in volume due to the sliding motion of said sliding member, said bearing portion and sliding member being provided with connection means for connecting said oil chambers to said lubrication means, said thrust bearing being provided with communication means for communicating the slidable contact surface of said orbiting scroll with respect to said thrust bearing with said oil chambers.





4,637,787

HYDRAULIC SCREW MACHINE

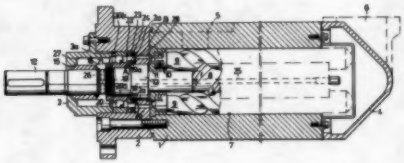
Lars H. Segerström, Skärholmen, Sweden, assignor to IMO AB, Stockholm, Sweden

Filed Jun. 14, 1985, Ser. No. 744,614

Claims priority, application Sweden, Jun. 20, 1984, 8403315

Int. Cl.[4] F04C *18/24*

U.S. Cl. 418—203 **4 Claims**



1. A hydraulic screw machine including:

a drive screw;

at least one running screw coacting with said drive screw;

a housing enclosing said drive screw and said running screw, said housing having an outlet chamber defining a high pressure side of said machine and an inlet chamber;

a shaft on said drive screw extending out through said housing on said high pressure side of said machine, said shaft being provided with a balancing piston for balancing a part of the axial forces acting on said drive screw;

a first collar on said shaft facing a radially extending wall portion of said housing to define with said balancing piston a balancing chamber forming a hydrostatic axial bearing with bearing surfaces to take up the remaining axial forces acting on said drive screw, characterized in that:

a second collar is arranged radially surrounding said first collar;

spring means is arranged between said second collar and said wall portion; and

a roller bearing is mounted in said housing having inner and outer bearing rings with said outer ring being mounted in said housing for limited axial movement, said inner bearing ring being secured on said shaft with said first collar being held between said balancing piston and said inner bearing ring, and said first collar being held separated from said wall portion by said spring means, said second collar and the axially movable outer ring of said roller bearing when too low a pressure prevails in said balancing chamber.

4,637,788

APPARATUS FOR MAKING A CONFECTION INCLUDING A DEPOSITING MEANS AND CONVEYOR CARRIED MOLDS

Brian T. Richards, Birmingham, England, assignor to Cadbury Limited, Bournville, England

Filed Oct. 5, 1983, Ser. No. 538,803

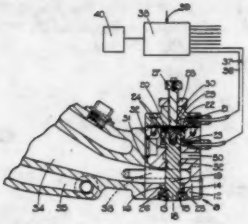
Claims priority, application United Kingdom, Oct. 13, 1982, 8229266; Oct. 29, 1982, 8231008

Int. Cl.[4] A23G *1/21, 1/22, 1/26*

U.S. Cl. 425—4 R **9 Claims**

1. Apparatus for manufacturing a confection comprising: means for introducing gas under pressure into a confection in liquid phase form; mixing means for mixing said confection in liquid phase form with said gas under pressure; a depositor for receiving and discharging said mixture; means for feeding said mixture from said mixing means to said depositor; and at least one outlet valve means for said mixture in said depositor comprising an annular seat, a movable valve member positioned for co-operation with said annular seat to control the flow of said mixture through said outlet valve means, a portion of said

valve member downstream of said valve seat defining with surrounding means an annular orifice means having a length



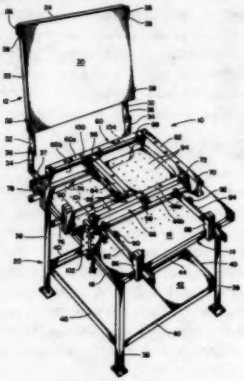
which is not greater than its diameter, said annular orifice means being a final outlet orifice means from said depositor.

4,637,789

CUSHION FABRICATION APPARATUS

Frederick P. Netznik, 8556 Central Park Ave., Skokie, Ill. 60076

Filed May 13, 1985, Ser. No. 732,937
Int. Cl.[4] B29C *39/26, 51/20*
U.S. Cl. 425—89 22 Claims



1. Apparatus for fabricating from a resilient, initially fluid, curable material, a cushion having a support surface contoured in accordance with a negative of the contour of an intended user, said apparatus comprising:

a generally planar plate having a plurality of apertures in a flat upper surface thereof and including a plurality of ducts therein, wherein each of said ducts is coupled to and continuous with at least one of said apertures;

form means disposed upon the upper surface of said plate for defining a closed area thereon, said form means including a plurality of connecting members secured to the upper surface of said plate and forming a closed structure open at the top, wherein some of said connecting members are adjustably movable upon said plate to allow for the fabrication of contoured cushions having a range of lengths and widths;

a plurality of seal means positioned between adjacent connecting members so as to form a sealed, closed structure on said plate;

a positive model positioned upon the upper surface of said plate within the closed area defined by said form means, said positive model having an upper surface configured in accordance with the seating support configuration of the intended user;

a flexible, nonporous membrane positioned over said form means and in contact with the upper surfaces of said positive model and said plate within the closed area defined by said form means thereon;

vacuum means coupled to said plate for evacuating the ducts therein whereupon said membrane is drawn in tight-fitting engagement with said form means and the upper surfaces of said positive model and said plate within the closed area defined by said form means thereon so as to form a closed receptacle adapted to receive and confine the fluid material deposited therein, with a contoured cushion formed therein following the curing of said fluid material; and

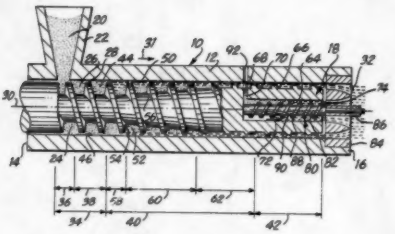
a plurality of control means each coupling said vacuum means to a respective duct within said plate whereby the vacuum within a selected array of apertures in said plate may be controlled in accordance with the length and width of the contoured cushion thus fabricated.

4,637,790

MULTIPLE-STAGE PLASTICATING EXTRUDERS

Imrich Klein, Highland Park, N.J., assignor to Scientific Process & Research, Inc., Somerset, N.J.

Filed Jun. 12, 1985, Ser. No. 744,022
Int. Cl.[4] B29B *7/10*
U.S. Cl. 425—208 25 Claims



1. In a multiple-stage plasticating extruder of the type having an axially-extending elongate barrel for preparing a plasticated material from solids introduced into the extruder and delivering the plasticated material to a discharge outlet, the improvement comprising:

a first screw conveyor for extending along a longitudinal axis in the barrel, said first screw conveyor including a first-stage flight defining a first-stage channel for continuously conveying the material in a downstream direction between a supply of said solids and a first-stage outlet for said plasticated material, as the material is melted within the first-stage channel, said first-stage flight having a leading face facing downstream and a trialing face facing upstream, said first-stage channel extending between the leading face and the trailing face;

a second-stage passage within the screw conveyor, said second-stage passage being axially coextensive with the first-stage channel and commumicating with the first-stage channel at an upstream location and at a downstream location to establish a multiple-stage melting path within the axial extent of the first screw conveyor along which the material will move through the first-stage channel and the second-stage passage, the upstream location being in position to receive some unplasticated material from the first-stage channel, and the downstream location being spaced axially downstream of the upstream location a distance sufficient to enable plastication within the second-stage passage of unplasticated material admitted to the second-stage passage;

a drainage opening interconnecting the first-stage channel and the second-stage passage at the upstream location for

enabling the flow of unplasticated material into the second-stage passage at the upstream location;

a second-stage outlet establishing said communication between the second-stage passage and the first-stage channel for enabling the flow of plasticated material from the second-stage passage to merge with the flow of plasticated material from the first-stage channel for delivery of all of the plasticated material to the discharge outlet;

a second screw conveyor located in said second-stage passage and including a second-stage flight defining a second-stage channel arranged to convey material from the upstream location to the downstream location so as to enable movement of material along the multiple-stage melting path through the second-stage passage; and

a vent in the barrel adjacent the upstream location.

4,637,791

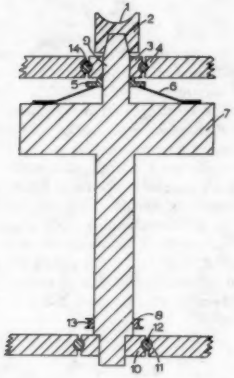
GYROSCOPICALLY STABILIZED SPIN CAST MACHINE

Charles W. Neefe, 811 Scurry St. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 642,114, Aug. 17, 1984, Pat. No. 4,534,915, which is a continuation-in-part of Ser. No. 506,873, Jul. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,641, Sep. 9, 1982, Pat. No. 4,416,837. This application Jun. 3, 1985, Ser. No. 740,569

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 425—425 **1 Claim**



1. A machine for spin casting concave optical surfaces said machine having a concave spin casting mold and a gyro rotor which gyroscopically stabilizes a vertically positioned rotating shaft supported by lower and upper ball bearings, the lower bearings are preloaded by the weight of the rotor and shaft, the upper bearings are preloaded by a spring force which moves a preload collar upward and forces the inner ball bearing race and the ball bearings upward against the outer bearing race, the lower ball bearings positioned below the gyro rotor and the upper ball bearings positioned above the gyro rotor and below the concave spin casting mold, movement of the rotor shaft away from the intended vertical position is resisted by the gyroscopic force provided by the rotating gyro rotor, changes in the rotational speed of the rotating shaft are resisted by the inertia force provided by the rotating gyro rotor.

4,637,792

PULSING COMBUSTION

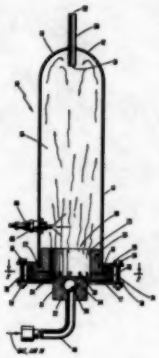
Robert E. Davis, Mountain Home, Ak., assignor to Arkansas Patents, Inc., Mountain Home, Ak.

Continuation-in-part of Ser. No. 666,458, Oct. 30, 1984, Pat. No. 4,569,310, which is a continuation-in-part of Ser. No. 403,769, May 26, 1982, Pat. No. 4,488,865, which is a continuation-in-part of Ser. No. 218,849, Dec. 22, 1980, Pat. No. 4,479,484. This application Oct. 11, 1985, Ser. No. 785,433

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.

Int. Cl.⁴ F23C *11/04*

U.S. Cl. 431—1 **6 Claims**



1. A pulsing combustion device comprising:

means for defining an elongate combustion chamber having an inlet for a combustible mixture and an unvalved outlet open to the atmosphere for combustion gases;

a floating valve member mounted in reciprocation relation in a wall of said combustion chamber, said valve member having a first side in communication with said combustion chamber and a second side in communication with a supply of a pressurized combustible mixture and having a plurality of ports through said valve member, means for directing said combustible mixture along the periphery of said combustion chamber; said reciprocation of said floating valve member in said wall closing and opening communication through said ports between said supply of combustible mixture and said combustion chamber;

means for supplying a pressurized combustible mixture to said second side of said floating valve member;

means for igniting and combusting said combustible mixture in said combustion chamber to produce pressurized combustion gases, said floating valve member being reciprocated by said pressurized combustible mixture in communication with said second side and said pressurized combustion gases in communication with said first side to regulate the flow of said combustible mixture into said combustion chamber.

4,637,793

FLARE GAS BURNER

Robert E. Schwartz; Roger K. Noble, and Michael R. Keller, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation of Ser. No. 645,420, Aug. 29, 1984, Pat. No. 4,579,521. This application Nov. 18, 1985, Ser. No. 798,855

Int. Cl.⁴ F23Q *9/00*

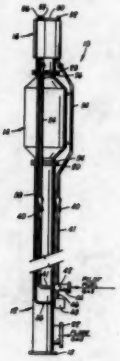
U.S. Cl. 431—202 **3 Claims**

1. In a tubular flare gas burner having an inlet end adapted to be mounted to a flare gas conduit and having a discharge end, the improvement whereby said burner is less susceptible to

damage caused by internal and/or external burning comprising:

an internal protective liner formed of refractory material attached within at least the discharge end portion of said burner whereby the internal surfaces of said burner are shielded from flame impingement and excessive heat caused by internal burning;

pilot burner means positioned adjacent the discharge end of said burner including conduits extending along and adjacent the external surfaces of said burner between the discharge and inlet ends thereof; and



an external protective covering formed of refractory material attached to and over at least the discharge end portion of said burner and the conduits of said pilot burner means extending therealong whereby the external surfaces of said burner and said conduits are substantially shielded from flame impingement and excessive heat caused by external burning and an aerodynamically improved external surface is provided on the discharge end portion of said burner, said external protective covering being comprised of relatively soft and flexible refractory material encasing said external burner surfaces and said conduits and covered by a hard inflexible refractory material.

4,637,794

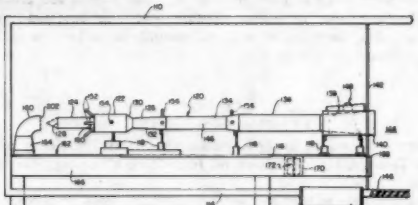
PULSE COMBUSTION DRYING APPARATUS FOR PARTICULATE MATERIALS

Robert R. Gray, 7110 Via Monte Mar, Gladstone, Oreg. 97027, and Val M. Marguth, 10015 SW. Kennedy St., Beaverton, Oreg. 97005

Filed Oct. 3, 1985, Ser. No. 783,860

Int. Cl.[4] F27B *15/00*; F27D *7/00*; F23C *11/04*

U.S. Cl. 432—58 **9 Claims**



6. In pulse jet combustion apparatus for the drying of particulate material of the type having

a combustion chamber having an air entry end, an exhaust end and a common longitudinal axis therebetween, an air inlet conduit coaxially connected to the air entry end thereof,

a primary exhaust gas conduit coaxially connected to the exhaust end thereof and,

a tailpipe coaxially connected to the end of said exhaust gas conduit for directing the exhaust gases past a locus of particulate material introduction and to a dried particulate receiving chamber

the improvements comprising

a plurality of primary fuel nozzles mounted at the air entry end of said combustion chamber downstream of said air inlet conduit and positioned to direct combustible fuel to a common location on the longitudinal axis of said combustion chamber spaced a predetermined distance from the air entry end thereof.

4,637,795

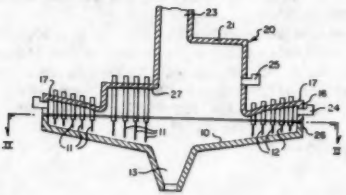
METHOD AND APPARATUS FOR CALCINING MATERIAL CONTAINING VOLATILE CONSTITUENTS

William E. Solano; James P. Docherty, and Joseph W. Stubenbort, all of Pittsburgh, Pa., assignors to Salem Furnace Co., Pittsburgh, Pa.

Filed Nov. 12, 1985, Ser. No. 797,150

Int. Cl.[4] F27B *9/16*; C10B *1/00*

U.S. Cl. 432—138 **6 Claims**



1. In a heating furnace for calcining a bulk material containing a volatile constituent including a stationary heated circular chamber, a wall surrounding said chamber, a hearth in said chamber, means for rotating said hearth around its vertical axis, a roof for said chamber, a discharge opening in the center of said hearth, and transport rabbles mounted in said roof extending into said hearth for urging material on said hearth toward said discharge opening when said hearth is rotated, the improvement comprising means positioned intermediate said discharge opening and said chamber wall so as to divide said chamber into at least an inner and an outer connecting co-axial annular portions, means in said outer portion to turn over and mix said material on said hearth in said outer portion against the direction of travel of said material and fuel burners in said dividing means.

4,637,796

OFFICE FABRICATED, ADJUSTABLE FUNCTION REGULATOR

Marcel Korn, 502 Lindell Ave., Leominster, Mass. 01453

Filed Feb. 25, 1985, Ser. No. 704,958

Int. Cl.[4] A61C *7/00*

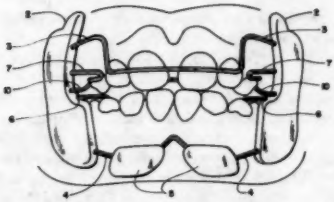
U.S. Cl. 433—7 **12 Claims**

1. An orthodontic function regulator adapted for demountable posterior attachment to the rear teeth of the maxillary arch and anterior positioning over the front teeth of the mandibular arch and further adapted for office assembly from a selection of prefabricated elements comprising:

A. Two buccal shield base assemblies adapted to receive and connect said elements of said regulator;

B. A lip-pad, lingual roller assembly unit, said unit being generally "U" shaped and adapted at its anterior, closed end to be positioned over the front teeth of the mandibular arch, said assembly having rotatably mounted thereon

labial roller means and lingual roller means adapted to be positioned labially and lingually respectively to the front teeth; said roler means being respectively mounted on generally "U"-shaped labial and lingual connector wires; the posterior ends of said wires being connected on each side of said assembly unit to an attachment plate; each of said plates being adapted to receive connecting means for demountably connecting said assembly unit to said base assemblies;



C. Connecting means for demountably connecting the posterior ends of said roller assembly unit to the anterior surface of said base assemblies;

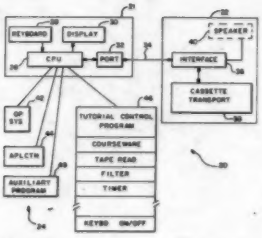
D. Two base assembly connecting means adapted to demountably connect said base assemblies to the buccal surface of the rear teeth of the maxillary arch; wherein one of each of said base assemblies is connected to one of each of the posterior ends of said "U" shaped lip pad, lingual roller assembly unit and one of each of said base assembly connecting means is connected to the posterior surface of each of said base assemblies.

4,637,797

SOFTWARE TRAINING SYSTEM

David R. Whitney, Burlingame, and Ronald B. Whitney, San Carlos, both of Calif., assignors to Access Learning Technology Corporation, San Mateo, Calif.

Filed Jan. 11, 1985, Ser. No. 690,785
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—118 **8 Claims**



1. A computer software training system comprising:

(a) a computer system including

central process (CPU) means for executing computer programs;

keyboard means for entering data and commands into said computer system;

display means responsive to said CPU means for displaying messages; and

port means for connecting said CPU means to a peripheral device; and

(b) cassette tape player means for providing an audio signal including oral instructions to a speaker, and for simultaneously providing keystroke data to said computer system;

wherein said audio signal has been previously recorded on the first track of a cassette tape having first and second tracks, and said keystroke data has been recorded on the second track of said cassette tape;

said cassette tape player means including

stereo cassette tape transport means in which a cassette tape having first and second prerecorded tracks can be mounted, including means for producing output signals from said first and second prerecorded tracks and for making signals corresponding to audible sounds which have been recorded on said first prerecorded track of a cassette tape mounted in said cassette tape transport available for transmission to a speaker; and

an interface for connecting said cassette tape player means to said port means, including

means for enabling said computer system to activate and deactivate said cassette tape transport; and

decoder means for receiving from said stereo cassette tape transport means keystroke data signals from said second prerecorded track on a cassette tape mounted in said stereo cassette tape transport, for decoding said keystroke data signals into binary keystroke data signals useable by a computer, and for enabling said computer system to receive said decoded keystroke data;

said computer system further including:

(c) tutorial control means, including

on/off software means for activating and deactivating said cassette tape means; and

keystroke receiving means for receiving keystroke data from said cassette tape player means and for passing at least some of said keystroke data to said computer system for use as though said keystroke data came from said keyboard means.

4,637,798

CHILD'S DOLL USEFUL FOR TEACHING COUNTING, COLOR IDENTIFICATION, AND FOR PROMOTING MANUAL DEXTERITY

Mary L. Malden-Nesset, 3072 Sunflower St., Thousand Oaks, Calif. 91360

Filed Nov. 2, 1984, Ser. No. 667,911
Int. Cl.[4] G09B *19/02*
U.S. Cl. 434—191 **12 Claims**

1. A doll useful as a child's plaything and also for teaching a child to count from 1 through 10, comprising:

a. two legs, two arms, a torso, and a head portion; and

b. at least ten groups of distinctive features, each group comprising a predetermined number of similar features, and said predetermined number being one of the numbers from one to ten so that each number from one to ten is represented by at least one such group;

wherein said ten groups comprise the following features:

a. one heart-shaped area;

b. two eyes;

c. three stars;

d. four snap fasteners;

e. five distinct points on each of said stars;

f. six eyelashes over one of the eyes;

g. seven eyelashes over the other of the eyes;
h. eight shoe eyelets;
i. nine distinct patches;
j. ten distinct fingers.

4,637,799

SYSTEM AND GAME THAT STIMULATES CREATIVE AND VERBAL EXERCISE

Robert A. Bouchal, 48 Liberty Ave., Somerville, Mass. 02144

Continuation of Ser. No. 147,201, May 6, 1980, abandoned, which is a continuation-in-part of Ser. No. 901,132, Apr. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 727,395, Sep. 29, 1976, abandoned. This application Nov. 27, 1981, Ser. No. 325,285

Int. Cl.[4] G09B *1/34*; A63F *1/00*

U.S. Cl. 434—236 **2 Claims**

1. A method of stimulating operation of associative powers of a subject person and evoking descriptive or narrative response from the subject comprising:

(a) providing a plurality of different, discrete visual representations arrangeable in a matrix-like array comprising a base group of a plurality of said representations and a plurality of additional groups each of a plurality of different discrete visual representations, and said discrete visual representations in said base group displaying examples of the same concept in at least next adjacent discrete representations and showing a concept in sequence, and said discrete representations in said additional groups displaying no example of the same concept as a group but each said representation in each additional group displaying an example of the same concept as a discrete representation relative to at least one other additional group or said base group;

(b) manually presenting first to the subject person said base group of discrete and different visual representations from said matrix with members of the base group arranged in a random order,

in a format permitting the subject person to arrange the said representations as a first visible pattern sequence elected by the subject as a logical order, and

in the said pattern, subsequently at least, to modify said pattern by substituting representations from said additional groups as presented to establish successive visible patterns;

(c) requesting the subject person to arrange the base group representations in a logical order as a first visible pattern;

(d) requesting the subject person to describe what he has done in establishing the pattern, or the significance of that pattern;

(e) manually presenting to the subject, successsively in a predetermined order, said plurality of additional groups of discrete and different visual representations from the matrix,

in a format permitting random presentation of the members in each successive additional group, and

permitting to the subject at least elective substitution of members from each succeedingly presented group for a visual representation in a prevailing said visible pattern of visual representations, and with removal from the visual field of all unused members of each additionally presented group and of members removed from any previously established visible pattern, before presentation of a further group;

(f) requesting the subject person to substitute members from the newly presented groups as presented for members in the prevailing pattern with which there is a logical connection, to establish a new pattern of discrete, visual representations; and when the subject has completed his effort at substitution to remove from view unused members of each additionally presented group and members from the preexisting pattern as a result of the substitution; and

(g) requesting the subject to describe each new pattern of visual representations as determined on presentation of each new additional group of a plurality of discrete visual representations, a majority of all said representations being representations of natural persons, animals, or things.

4,637,800

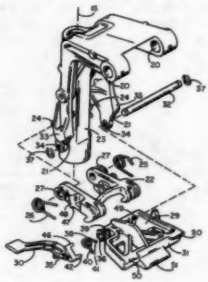
SHALLOW WATER TILT MECHANISM FOR OUTBOARD MOTORS

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 9, 1985, Ser. No. 765,016

Int. Cl.[4] B63H *5/06*

U.S. Cl. 440—55 **5 Claims**



5. A tilt mechanism for a marine propulsion device comprising:

(A) a transom bracket for attachment to a boat;

(B) a swivel bracket pivotally supported on said transom bracket for tilting movement about a generally horizontal tilt axis;

(C) a shallow drive bracket pivotally supported on said swivel bracket for rotation about a generally horizontal support axis between a retracted position and a shallow drive position, said shallow drive bracket engaging said transom bracket in said shallow drive position to support said swivel bracket;

(D) an operating lever pivotally mounted on said swivel bracket for rotation about said support axis; and

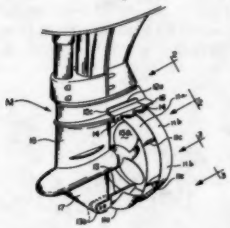
(E) a double acting spring means for biasing said shallow drive bracket toward a fixed angular position relative to said operating lever.

4,637,801

THRUST ENHANCING PROPELLER DUCT ASSEMBLY FOR WATER CRAFT

William C. Schultz, Chula Vista, Calif., assignor to William H. Flood, Chula Vista, Calif., a part interest

Continuation-in-part of Ser. No. 630,329, Jul. 12, 1984, abandoned. This application Oct. 15, 1984, Ser. No. 661,213
Int. Cl.[4] B63H 5/15
U.S. Cl. 440—67 9 Claims



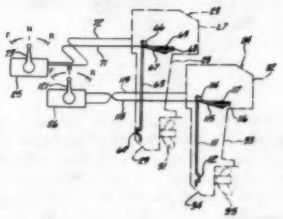
1. A thrust-enhancing duct assembly mounted on the propeller housing of a water craft comprising: a primary cowling mounted on the housing coaxially with the axis of rotation of the propeller, at least a portion of the primary cowling extending forward of the propeller and beyond the plane thereof; a secondary cowling coaxially mounted with respect to the primary cowling and spaced axially therefrom in overlapping relationship therewith so that the leading edge of the secondary cowling extends over the trailing edge of the primary cowling and the trailing edge of the secondary cowling extends rearwardly beyond the plane of the propeller, the secondary cowling being spaced radially from the primary cowling to create an annular space between the primary and secondary cowlings, with the primary cowling controlling the flow of water into the annular space to create a venturi effect; a plurality of axial vanes secured to said primary cowling at spaced annular positions around the outer surface of said primary cowling and secured to the inner surface of said secondary cowling to hold said cowlings in spaced and coaxial relationship, said vanes being shaped and positioned to create a counter rotating vortex in relation with the propeller vortex.

4,637,802

TWIN OUTBOARD DRIVE FOR WATERCRAFT

Michihiro Taguchi, and Akihiro Onoue, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 29, 1986, Ser. No. 823,593
Claims priority, application Japan, Jan. 31, 1985, 60-15413
Int. Cl.[4] B63H 21/28
U.S. Cl. 440—75 26 Claims



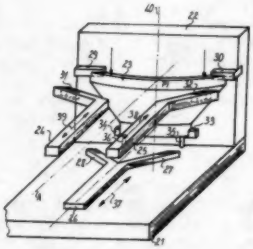
1. In a twin outboard drive for a watercraft comprising a first marine drive having a first transmission providing a forward, a neutral and a reverse drive ratio, a second marine drive having a second transmission providing a forward, a neutral and a reverse drive ratio, a first shift element movable between a forward, a neutral and a reverse position for operating said first transmission in those respective ratios, a second shift element movable between a forward, a neutral and a reverse position for operating said second transmission in those respective ratios, said first and said second shift elements being movable in like directions with the forward position of said first shift element corresponding to the reverse position of said second shift element and vice versa, a first shift control movable between a forward, a neutral and a reverse position, and a second shift control movable between a forward, a neutral and a reverse position, said first and said second shift controls being movable between their positions in like directions, the improvement comprising motion transmitting means operatively connecting said first shift control with said first shift element and said second shift control with said second shift element, said motion transmitting means being constructed and arranged for providing that the movement of said first and said second shift controls in the same direction from their forward position to their reverse position effect opposite movement of said shift elements.

4,637,803

PROCESS FOR POSITIONING AND GRASPING SEMI FERRITES FOR A MAGNETIC CORE AND CENTERING DEVICE FOR OPERATING SAID PROCESS

Jean Rousseau, Genlis, and Jean P. Fourche, Marsaunay la Cote, both of France, assignors to Videocolor, Montrouge, France

Filed Feb. 19, 1985, Ser. No. 702,602
Claims priority, application France, Feb. 21, 1984, 84 02570
Int. Cl.[4] H01J 9/236
U.S. Cl. 445—23 16 Claims



1. Process for positioning and grasping a semi ferrite for a magnetic core, especially for a cathode tube deflector, the semi ferrite comprising on its edges, created by the fracture plane, position reference elements of its magnetic axis, comprising the steps of: applying said semi ferrite on a positioning table; resting said semi ferrite on centering elements in relation to the said reference elements of the semi ferrite; grasping said semi ferrite by a clip in a position such that the clip allows the retention of data as to the position of the magnetic axis, independently of the table and of the centering elements of the table.

4,637,804

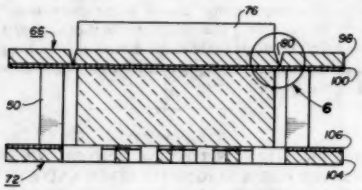
METHOD OF CONSTRUCTING AN ELECTRON GUN HAVING AN IMPROVED TRANSITION MEMBER AND PRODUCT THEREOF

Harry E. McCandless, Manor Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1986, Ser. No. 844,346
Int. Cl.[4] H01J 9/12
U.S. Cl. 445—36 2 Claims

1. In a method of constructing an electron gun for a cathode-

ray tube, said electron gun including at least one cathode assembly and at least two spaced, successive electrodes having aligned apertures therethrough for passage of at least one electron beam, said electrodes being held in position from a common ceramic member having a first major surface and an oppositely disposed second major surface with a metallized pattern formed on at least a portion of each major surface, a bimetal first transition member being disposed between at least one of said electrodes and said first major surface of said common ceramic member, said bimetal first transition member comprising two layers of metal bonded face-to-face along an interface extending therebetween, a first layer of metal having a melting point higher than that of a second layer of metal, said second layer being brazed to said metallized pattern on said first major surface, said bimetal first transition member including at least one electrode contact portion and a removable frame portion, the improvement comprising



providing a V-notched weakened bridge region interconnecting said frame portion and said electrode contact portion of said first transition member, said V-notched bridge region extending through said first layer of metal and terminating at the interface with said second layer of metal,

removing said frame portion from said electrode contact portion at said V-notched bridge region by melting said second layer of metal when said second layer is brazed to said metallized pattern on said first major surface of said common ceramic member, thereby providing a substantially smooth edge on said contact portion when said frame portion is removed.

4,637,805

APPARATUS AND METHODS FOR ENGAGING TOOTHPICKS TO ASSEMBLE A TOY STRUCTURE

Willard L. Sweetin, 5956 Fazon Rd., Bellingham, Wash. 98226

Filed Dec. 14, 1984, Ser. No. 681,871
Int. Cl.[4] A63H *33/10*
U.S. Cl. 446—71 **18 Claims**

1. Apparatus for engaging toothpicks to assemble a toy structure of multiple configurations, said apparatus comprising:

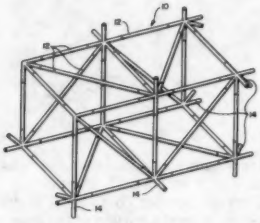
a. a support member including a plurality of support sleeves radiating outwardly therefrom, each of said support sleeves having a conically shaped passageway therein for engaging one of said toothpicks in a frictional fit therewith in proximity to an end of said toothpick, with each of said support sleeves connecting its said toothpick to said support member, whereby said toy structure is assembled by interconnecting said toothpicks with a plurality of said support members to form various structural configurations of said toy structure;

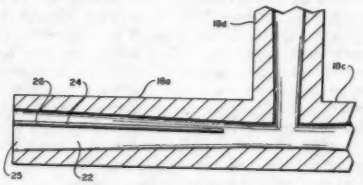
b. at least some of said support sleeves being horizontal support sleeves radiating outwardly from said support member in a horizontal plane to secure at least some of said toothpicks thereto in a horizontal structural relationship, said horizontal support sleeves being sized to a predetermined length to accommodate toothpicks of a uniform length within said structure, said horizontal support sleeves including:

i. at least one first horizontal support sleeve for securing at least one of said toothpicks between adjacent support members which occupy said horizontal plane,

ii. at least one second diagonal horizontal support sleeve for securing at least one of said toothpicks to diagonally located support members which occupy said horizontal plane, said second diagonal horizontal support sleeve having a lengthwise dimension which is greater than the lengthwise dimension of said first horizontal support sleeve to accommodate toothpicks of a uniform length in said toy structure;

c. at least some of said support sleeves being vertical support sleeves radiating outwardly from said support member in a vertical plane to secure at least some of said toothpicks thereto in a vertical structural relationship, said vertical support sleeves being sized to a predetermined length to





accommodate toothpicks of a uniform length within said structure, said vertical support sleeves including:

i. at least one first vertical support sleeve for securing at least one of said toothpicks between adjacent support members occupying said vertical plane;

ii. at least one second diagonal vertical support sleeve for securing at least one of said toothpicks to diagonally located support members which occupy said vertical plane, said second diagonal vertical support sleeve sized to a predetermined length to accommodate toothpicks of uniform length in said toy structure;

d. the length of each second diagonal horizontal support sleeve as measured from a center of said support member to an end of said diagonal support sleeve being determined by the following relationship:

$$d = \frac{t + 2s}{2 \cos A} - \frac{t}{2}$$

wherein "d" is the length of said diagonal horizontal support sleeve, "s" is the length of said first horizontal support sleeve as measured from the center of said support member to an end of said first horizontal support sleeve, "t" is the length of said toothpick minus the length of two end segments of said toothpick defined by the locations where said toothpick is engaged by said support sleeves, and "A" is an angle formed by the convergence of said second diagonal horizontal support sleeve and said first horizontal support sleeve;

e. the length of said second diagonal vertical support sleeve

as measured from the center of the support member to the end of said diagonal vertical support sleeve being determined by the following relationship:

$$d = \frac{t + 2s}{2 \cos A} - \frac{t}{2}$$

wherein "d" is the length of said diagonal vertical support sleeve, "s" is the length of said first vertical support sleeve as measured from the center of said support member to the outward end of said first vertical support sleeve, "t" is the length of said toothpick minus the lengths of two end segments of said toothpick defined by the locations where said toothpick is engaged by said support sleeves, and "A" is an angle formed by the convergence of said diagonal vertical support sleeve and said first vertical support sleeve.

4,637,806

ARRANGEMENT FOR MOUNTING SWIVEL PIN BEARING IN YOKE OF UNIVERSAL JOINT

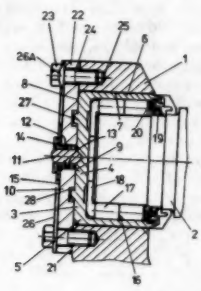
Armin Olschewski, Schweinfurt; Bernhard Bauer, Hassfurt, and Elisabeth Zirk, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 711,068

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409078

Int. Cl.⁴ F16D *3/40*

U.S. Cl. 464—130 **6 Claims**



1. In a swivel pin bearing for rotatably seating a swivel pin in a yoke eye of a yoke arm, including a bushing having a base portion and a sleeve portion integrally formed with the periphery of said base portion, said sleeve portion being arranged in said yoke eye with radial seating play and said base portion having a planar outer surface, and a support plate having an inner planar surface arranged to oppose said outer surface of said base portion of said bushing and releasably secured to said yoke arm, the improvement wherein said bearing further includes means for coupling said bushing to said support plate such that axial displacement of said bushing relative to said support plate is substantially prevented and said bushing is capable of a sliding radial displacement relative to said support plate which is greater than said seating play, said coupling means comprising a rigid holding element rigidly connected to said outer surface of said base portion, said support plate having an axial orifice, said holding element comprising an axial portion extending from said outer surface of said base portion and arranged with radial play in said axial orifice and a radial portion rigidly connected to the end of said axial portion, said radial portion of said holding element abutting an outer surface of said support plate in an area adjacent said axial orifice.

4,637,807

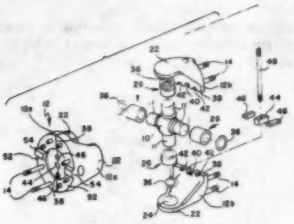
SPLIT YOKE UNIVERSAL JOINT

Robert K. Koelling, Sr., Dallas, Tex., assignor to Morgan Construction Company, Worcester, Mass.

Filed Jun. 13, 1985, Ser. No. 744,227

Int. Cl.⁴ F16D *3/40*

U.S. Cl. 464—135 **4 Claims**



1. A universal joint for providing a drive connection between the flanged ends of two rotatable elements, said joint comprising:

a cross formed by two mutually perpendicular pairs of coaxially aligned trunnions;

a pair of yokes, each yoke being subdivided into separate mating half sections, each half section including a base portion with an integral forwardly protruding bearing cap having a blind bore formed therein;

bearings contained in said blind bores, the mating half sections of each yoke being adapted for assembly onto a pair of said trunnions, with each trunnion being journalled for rotation in one of said bearings, and with the base portions of the thus assembled mating half sections having juxtaposed surfaces located on opposite sides of a first yoke reference plane passing through the center of the joint;

first key means for opposing relative movement of the thus assembled mating half sections in directions parallel to their respective first yoke reference planes, said first key means lying on said first yoke reference planes and extending into complimentary opposed keyways in said juxtaposed surfaces;

first connecting means for separably interconnecting the thus assembled mating half sections, said first connecting means extending through said mating half sections in directions perpendicular to their respective first yoke reference planes;

second connecting means for detachably mounting the thus assembled and interconnected mating half sections to a respective one of said flanged ends, said mating half sections and said flanged ends having mutually abutting surfaces lying on second yoke reference planes which are perpendicular to the respective second connecting means and the first yoke reference planes; and

second key means for mechanically coupling the thus assembled, interconnected and mounted mating half sections to their respective flanged ends, said second key means being formed integrally with said half sections and protruding rearwardly therefrom into recesses in said flanged ends.

4,637,808

BICYCLE REAR DERAILLEUR

Shizuo Nakamura, Kobe, Japan, assignor to Kawamura Cycle Co., Ltd., Kobe, Japan

Filed Feb. 15, 1985, Ser. No. 701,874

Claims priority, application Japan, Feb. 16, 1984, 59-28161; Feb. 27, 1984, 59-27896[U]

Int. Cl.⁴ F16H *9/24*

U.S. Cl. 474—80 **4 Claims**

1. A bicycle rear derailleur for shifting an endless drive chain from one sprocket to another sprocket of a multiple

freewheel having a plurality of different sized sprockets and mounted on a rear wheel hub of a bicycle, comprising:

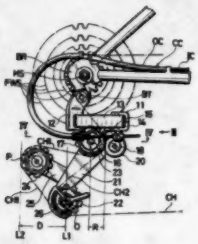
a guide pulley;

a tension pulley;

a tensioner frame means for rotatably supporting said guide pulley and said tension pulley;

a shifter means for shifting said tensioner frame means in directions substantially parallel with respect to an axis of said rear wheel hub;

said tensioner frame means including a tension pulley support arm which is resiliently urged to be pivotally moved rearwardly of said bicycle;



said tension pulley being rotatably supported at a free end of said tension pulley support arm;

a compensating means for compensating a sagging in said endless drive chain; and

said compensating means being arranged so as to stretch out said endless drive chain rearwardly of said bicycle so that a distance between a geometrical vertical line passing through a center of said tension pulley and a vertical tangential line at a rearmost point of a rearwardly stretched portion of said endless drive chain on said compensating means is larger than a radius of said guide pulley when said tension pulley support arm takes its rearmost position.

4,637,809

REAR DERAILLEUR FOR A BICYCLE

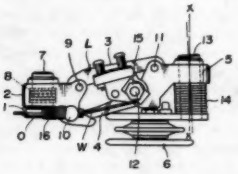
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,615

Claims priority, application Japan, Nov. 30, 1984, 59-254687; Oct. 2, 1985, 60-219829

Int. Cl.[4] F16H 9/00

U.S. Cl. 474—80 **6 Claims**



1. A rear derailleur for a bicycle which shifts a driving chain from one sprocket to another at a multistage sprocket assembly for the bicycle, said rear derailleur comprising,

(a) a fixing member,

(b) a linkage mechanism provided with a base member, two linkage members and a movable member,

(c) a first horizontal shaft for pivoting said linkage mechanism swingably to said fixing member,

(d) a chain guide comprising a guide pulley, a tension pulley, and a pulley plate having an urging surface which extends in the direction of the travelling path of said chain travelling to each sprocket at said multistage sprocket assembly and is opposite to said chain,

(e) a second horizontal shaft for swingably pivoting said chain guide to said movable member,

(f) a first biasing means which is interposed between said fixing member and said linkage mechanism and biases said linkage mechanism in the direction of moving said guide pulley away from the center of said multistage sprocket assembly,

(g) a second biasing means which is interposed between said movable member and said chain guide and biases said chain guide in the direction of applying tension to said chain, and

(h) a holding means which responds to swinging motion of said linkage mechanism and said chain guide when swinging, thereby holding an interval between said urging surface and said chain more than a predetermined interval.

4,637,810

ADJUSTABLE ENDLESS BELT

Paul Beck, 1100 N. Alta Loma Rd., Los Angeles, Calif. 90069

Filed Mar. 12, 1984, Ser. No. 588,733

Int. Cl.[4] F16G 3/00

U.S. Cl. 474—253 **10 Claims**

1. A continuously adjustable endless belt for use in power transmission comprising an outer length of flexible tear-resistant material, a cylindrical channel of constant radius extending logitudinally through said outer length of material, at least one length of reinforcing material disposed in said outer length of material and extending the length thereof, a cylindrical cord of constant radius constructed of flexible tear-resistant material slidably disposed within said channel, a length of reinforcing material disposed in said cord and extending the length thereof, the length of said cord being equal to the length of said outer length of flexible material such that upon pulling a portion of said cord from one end of said outer length of material, applying an adhesive material to said portion of said cord and disposing said portion within said channel in the other end of said outer length of material, a continuous belt of uniform construction is defined.

4,637,811

CONTAINER DIE SYSTEM

Joe L. Fortney, Gas City, Ind., assignor to Peerless Machine & Tool Corporation, Marion, Ind.

Filed Oct. 15, 1985, Ser. No. 787,732

Int. Cl.[4] B31B 1/44

U.S. Cl. 493—167 **13 Claims**

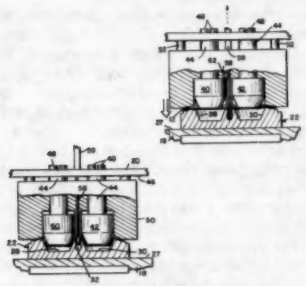
1. A press die system for substantially simultaneously forming at least two containers with a common region extending therebetween from a single sheet of paperboard material or the like, the press die system comprising

a female die assembly formed to include a first container-forming cavity, a second container-forming cavity in spaced relation to the first cavity, and a paperboard material-receiving cavity situated between the first and second container-forming cavities,

blade means confronting the paperboard-receiving cavity for pressing a portion of the sheet into the material-receiving cavity prior to formation of the at least two interconnected containers to provide a reservoir of excess paperboard material for use in forming the at least two interconnected containers, and

male die means for substantially simultaneously pressing the single sheet into the first and second container-forming

cavities to form the two interconnected containers causing paperboard material placed in the material-receiving cavity by the blade means to be drawn therefrom toward at least one of the container-forming cavities during operation of the male die means so that common regions interconnecting adjacent containers remain substantially intact and untorn during formation of the interconnected containers.

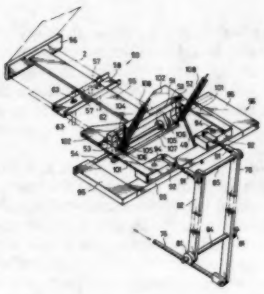


4,637,812

APPARATUS FOR FOLDING WEB-SHAPED MEMBER

Kenji Ogawa, Musashino, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1984, Ser. No. 649,391
Int. Cl.[4] B05B *1/14*
U.S. Cl. 493—357 **8 Claims**



8. A folding device for an elongated continuous strip of plastic web material having laterally spaced elongate cuts formed therein at regular intervals in the longitudinal direction thereof, comprising:

frame means;

a pair of spaced folded end receiving members mounted on said frame means;

means defining a pathway for said web material on said frame means;

reciprocal feed means on said frame means for feeding said continuous strip of plastic web material in a zigzag manner so that web material sections are stacked one on top of the other between folded end portions thereon, said folded end portions thereon being oriented adjacent said folded end receiving members, said feed means including a pair of film feeding arms each having a proximal end and a forward end, said film feeding arms each being pivotally supported at said proximal end adjacent said folded end receiving members so that said forward ends of said film feeding arms are alternately movable to sand from said folded end portions to orient said film in said zigzag manner, said film feeding arms being pivotal between an upright position inclined to the upper surface of said zigzag folded web material spacing said forward end from said folded end portions and a position parallel to the upper surface of said zigzag folded web material, each film feeding arm having intermediate said proximal end and said forward end a keep plate adapted to engage said upper surface of said web material folded in said zigzag manner, said keep plate having means defining holes therein that are alignable with said cuts when said keep plate engages said upper surface; and

a plurality of receiving surfaces for receiving thereon said zigzag folded web material, said receiving surfaces each having at least a pair of holes therethrough;

two rod-like insert members on each of said receiving surfaces received in said cuts in said web material in response to said keep plate pressing down on said upper surface when said film feeding arm is in said position parallel to said upper surface; and

means for tying said web material in a predetermined quantity, including tying members inserted into said cuts in said web material through said insert members and a bend member for bending one end of a said tying member inserted into a superposed arrangement of said cuts.

4,637,813

BLOOD PROCESSING ASSEMBLY INCLUDING A PREPACKAGED FLUID CIRCUIT MODULE

James H. DeVries, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 100,975, Dec. 6, 1979, which is a continuation of Ser. No. 843,223, Oct. 18, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 424,823
Int. Cl.[4] A61F *2/16*
U.S. Cl. 604—6 **20 Claims**

1. A blood processing assembly comprising

an apparatus including at least two pump rotors and a centrifuge device, and

a prepackaged, self-contained fluid circuit module including

flexible first conduit means having an inlet end adapted for communication with the circulatory system of a patient-donor and a spaced outlet end, said first conduit means defining a fluid pathway for whole blood withdrawn from the patient-donor,

a first fluid receiving receptacle attached to said outlet end of said first conduit means and adapted for mounting in said centrifuge device, said first fluid receiving receptacle including zones for the collection of platelet-rich plasma and red blood cells in response to operation of said centrifuge device,

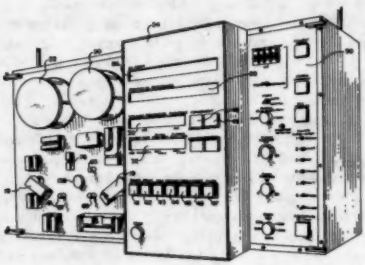
flexible second conduit means having an inlet end attached to and communicating with said first fluid receiving receptacle at said zone for the collection of platelet-rich plasma and a spaced outlet end, said second conduit means defining a fluid pathway for the platelet-rich plasma,

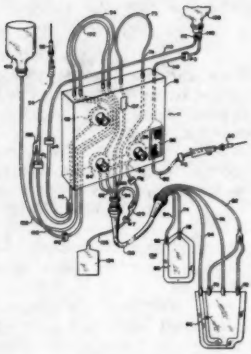
a second fluid receiving receptacle attached to said outlet end of said second conduit means and adapted for mounting in said centrifuge device, said second fluid receiving receptacle including a zone for the collection of plasma in response to operation of said centrifuge device, and

housing means having sidewalls peripherally defining a hollow interior and including means on said sidewalls for supporting each of said conduit means intermediate said inlet and outlet ends thereof within the confines of said hollow interior with a portion of each of said conduit means supported in a predetermined arcuate configuration outwardly bowed from one of said sidewalls and being resiliently biased toward an upright position generally perpendicular to said one side wall with said outwardly bowed portions of said first and second conduit means being positioned in a spaced, noncontiguous relationship

along said one sidewall to accommodate separate operative contact with said pump rotors, and

means for removably mounting said fluid circuit assembly on said apparatus with said one sidewall disposed adjacent to





said pump rotors to enable operative contact of said outwardly bowed portion of said first conduit means with one of said pump rotors and one said outwardly bowed portion of said second conduit means with the other one of said pump rotors.

4,637,814

METHOD AND APPARATUS FOR INTESTINAL IRRIGATION

Arnold Leiboff, 20 Wendell St., Hempstead, N.Y. 11550

Filed Apr. 5, 1985, Ser. No. 720,571

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—27 **21 Claims**

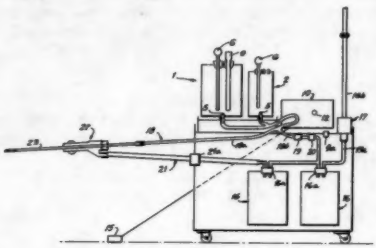
1. Apparatus for undirectional irrigation of at least a portion of the gastrointestinal tract including the bowel, said gatrointestinal tract portion to be irrigated defined between a point of access and an occluded distant point, comprising:

drain tube means for collecting effluent from the gastrointestinal tract portion, said drain tube means including a primary tubular section having a distal end portion and a proximal end portion and further including means for conducting effluent from the gastointestinal tract portion being irrigated to a region external thereof;

irrigating tube means for conducting irrigant to a region proximate to an occluded distant point in the gastrointestinal tract portion, said irrigating tube means having a distal end and a proximal end and including an elongate tubular member having at least one lumen extending between said distal and proximal ends and in fluid communications at its proximal end with a source of irrigant, said irrigating tube means having first aperture means formed therein communicating with said at least one lumen and opening externally of said irrigating tube means only at a region thereof situated substantially proximate to said distal end of said irrigating tube means;

said drain tube means and said irrigating tube means being formed so that a portion of said elongate tubular member of said irrigating tube means is situated within said primary tubular section of said drain tube means, said elongate tubular member of said irrigating tube means having a length such that upon said insertion of said irrigating tube means, said distal end of said irrigating tube means is situated substantially at the occluded distant point of the gastointestinal tract portion and said proximal end of said irrigating tube means is situated externally of said proximal end portion of said drain tube means; and

fluid sealing means extending between said primary tubular section of said drain tube means and said tubular member portion of said irrigating tube for preventing effluent entering into said distal end portion of said primary tubu-



lar section from being discharge from said proximal end portion thereof, said fluid sealing means including a cuff member having a bore formed therethrough through which at least a portion of said tubular member of said irrigating tube passes, said cuff member adapted to sealingly engage said primary tubular section of said drain tube means;

whereby with said drain tube means and irrigating tube means inserted in the gastrointestinal tract portion, irrigant conducted into the proximal end of said at least one lumen flows therethrough and is discahrged therefrom through said first aperture means at said region situated substantially proximate to said distal end of said irrigating tube means at the occlued distant point of the gastrointestinal tract portion whereupon said irrigant flows unidirectionally through said gastointestinal tract portion towards said drain tube means whereupon irrigant carrying the contents or said gastointestinal tract portion in the form of effluent enters into said drain tube means and is discharged therefrom through said effluent conducting means thereof.

4,637,815

IRRIGATIONAL HEMOSTATIC SOLUTION

Gerald M. Lemole, 404 Tomlinson Rd., Huntingdon Valley, Pa. 19046

Filed Aug. 6, 1985, Ser. No. 763,056

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—28 **12 Claims**

1. A method of reducing mediastinal fibrinolysis in open heart surgery patients, comprising the steps of:

topically applying a hemostatic solution to the mediastinum followed by closing the pericardium, said solution comprising a saline solution at body temperature of a pharmacologically active mixture of calcium chloride, epsilon-

aminocaproic acid, protamine, thrombin and norepinephrine dissolved therein.

4,637,816

APPARATUS FOR THE ORAL ADMINISTRATION OF CAPSULES TO ANIMALS

Derek Mann, Derby, England, assignor to Dobson Park Industries, PLC, England

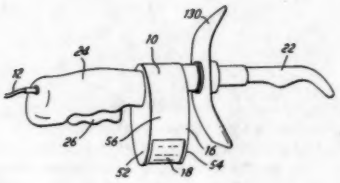
PCT No. PCT/GB84/00143, § 371 Date Dec. 12, 1984, § 102(e) Date Dec. 12, 1984, PCT Pub. No. WO84/04239, PCT Pub. Date Nov. 8, 1984

PCT Filed Apr. 26, 1984, Ser. No. 682,001

Claims priority, application United Kingdom, Apr. 26, 1983, 8311345

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—62 **19 Claims**



1. Apparatus for the oral administration of capsules to animals, comprising a tubular member having a tip and having a length such that when inserted into the animal's mouth the tubular member extends above the animal's tongue, said tubular member having a lower contact surface which engages the animal's tongue to hold the same in position, and said tip having an upper contact surface forwardly of the lower contact surface which engages the soft palate near the root of the animal's tongue to initiate swallowing, means for introducing a capsule into the tubular member rearwardly of the tip, in which the tip consists of two tip portions extending from the mouth of the tubular member and laterally spaced from one another so as to define a cavity in which a capsule is deposited at the root of the animal's tongue.

4,637,817

SEQUENCE VALVE FOR PIGGYBACK IV ADMINISTRATION WITH OCCLUSION FAILURE SENSING

G. Kent Archibald, White Bear Lake, and Frank A. Slaker, New Brighton, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 676,020, Nov. 29, 1984. This application Nov. 14, 1985, Ser. No. 797,929

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—81 **27 Claims**

13. A sequence valve for selectively occluding first and second flexible tubes in sequence, the sequence valve comprising:

spring biased pivotable tube pincher means for pinching off the first and then the second flexible tube;

pivotable latch means for holding the tube pincher in a position in which the first tube is pinched off;

a solenoid means which releases the latch in response to a control signal to permit the latch to pivot out of engagement with the tube pincher and thereby allow the tube pincher to pivot to a position in which the second tube is pinched off; and

means for sensing a condition indicative of a failure of the tube pincher to pinch off the second tube and providing a signal in response thereto.

4,637,818

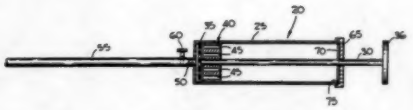
APPARATUS FOR PRODUCING STERILITY IN FEMALE ANIMALS

Richard K. Johnson, 20656 View Oaks Way, San Jose, Calif. 95120, and John W. Algeo, P.O. Box 158, Templeton, Calif. 93465

Division of Ser. No. 555,063, Nov. 23, 1983. This application Nov. 18, 1985, Ser. No. 799,316

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—89 **7 Claims**



1. Apparatus for injecting flowable material comprising:

(a) a cylinder, said cylinder being formed with a discharge opening at one end thereof;

(b) a piston rod disposed in said cylinder, said piston rod being movable over a rectilinear path in said cylinder, said piston rod at one end section thereof projecting out of said cylinder;

(c) a flexible member disposed in said cylinder and secured to said piston rod at the other end section thereto for movement therewith;

(d) a plunger disposed in said cylinder and secured to said piston rod for movement therewith, said plunger being disposed adjacent said flexible member between said flexible member and said one end section of said piston rod,

(e) said plunger, said flexible member and said piston rod being arranged coaxially, said plunger being formed with a plurality of axially disposed metering apertures therethrough, said metering apertures containing predetermined quantities of material to be mixed within said cylinder;

(f) a sealing lid separately attached to said cylinder at the other end thereof and formed with a central opening to receive said piston rod for reciprocating movement over said rectilinear path, said cylinder being arranged to contain flowable material insertable into said cylinder at the other end thereof; and

(g) a handle attached to said one end section of said piston

rod projecting out of said cylinder for imparting a reciprocating movement to said piston rod over said rectilinear path, the movement of said piston rod away from said discharge opening causes said flexible member to flex in one direction for unsealing said metering apertures in said plunger at the end thereof adjacent said flexible member for the mixing of t[1-2] material in said metering apertures of said plunger with the flowable material in said cylinder as said piston rod travels away from said discharge opening, and the movement of said piston rod toward said discharge opening causes said flexible member to flex in an opposite direction for sealing said metering apertures in said plunger at the end thereof adjacent said flexible member to urge said mixed material in said cylinder to be discharged through said discharge opening during the travel of said piston rod by the urging action of said plunger and said flexible disc.

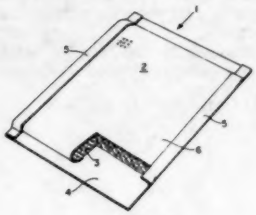
4,637,819

MACROSCOPICALLY EXPANDED THREE-DIMENSIONAL POLYMERIC WEB FOR TRANSMITTING BOTH DYNAMICALLY DEPOSITED AND STATICALLY CONTACTED FLUIDS FROM ONE SURFACE TO THE OTHER

William R. Ouellette; Daniel S. Alcombright; John J. Curro, and E. Kelly Linman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 31, 1985, Ser. No. 740,083
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—369 **30 Claims**

1. A macroscopically expanded, three-dimensional fluid-handling polymeric web having first and second surfaces located in substantially parallel planes which are remote from one another, said web including a multiplicity of fluid-handling capillary networks of macroscopic cross-section for rapidly transmitting fluids which are dynamically deposited on said first surface of said web to said second surface of said web using the dynamic and gravitational head of the fluid as a primary driving force, each of said macroscopic cross-section capillary networks originating as an aperture in said first surface of said web and having a continuously interconnected sidewall extending in the direction of said second surface of said web, said continuously interconnected sidewall terminating to form at least one aperture in said second surface of said web, whereby the bulk of said dynamically deposited fluid is transmitted from said first surface to said second surface of said web by said macroscopic cross-section capillary networks, said



first surface of said web in which said macroscopic cross-section capillary networks originate further including a multiplicity of fluid-handling capillary networks which are substantially smaller in cross-section than said macroscopic cross-section fluid-handling capillary networks, said smaller fluid-handling capillary networks exhibiting a degree of capillary suction sufficient to transmit static fluid contained on the surface of objects which contact said first surface of said web generally in the direction of said second surface of said web by capillary attraction.

4,637,820

COPPER-MODIFIED CARBOXYALKYL-CELLULOSE FIBER

Ingo G. Marini, Lenzing, Austria, and Scarlet Sustmann, Viersen, Fed. Rep. of Germany, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Mar. 4, 1985, Ser. No. 708,139

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1984, 3408131

Int. Cl.[4] D01F *1/10, 2/24*

U.S. Cl. 8—129 22 Claims

1. A modified fibrous material consisting essentially of viscose fibers modified by anionic moieties of the general formula:

$$-(CH_2)_n-COO^{(-)};$$

wherein n is from 1 to 3;

which anionic moieties are each attached through an oxygen atom to a viscose anhydroglucose unit; wherein sufficient of said anionic moieties are present, and sufficient of said present anionic moieties are capped by copper cations, that said viscose fibers bind from about 0.1 to 3.0% by weight of copper, based on the weight of said fibers.

4,637,821

TINCTORIAL COMPOSITION FOR KERATIN FIBRES, BASED ON NITRATED BENZENE DYESTUFFS

Christian Monnais, Neuilly-sur-Seine, and Jean Cotteret, Franconville, both of France, assignors to L'Oreal, Paris, France

Filed Sep. 30, 1982, Ser. No. 428,523

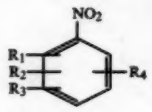
Claims priority, application Luxembourg, Oct. 8, 1981, 83686

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—415 13 Claims

1. A composition suitable for dyeing human hair, which comprises in an acceptable cosmetic medium, an amount effective to dye hair of

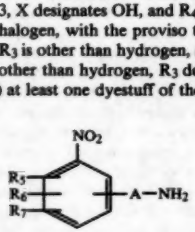
(a) at least one dyestuff of the formula:



(I)

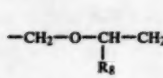
in which R_1 and R_2 independently designate hydrogen, amino, alkylamino, —NH—aliphatic—$(X)_m$, dialkylamino or —N—(aliphatic—$(X)_m)_2$, R_3 designates hydrogen, OH, alkoxy or —O—aliphatic—$(X)_m$, "aliphatic" designates an aliphatic radical having m+1 free valencies, m designates an integer from 1 to 3 such that if m=1, X represents OH, Cl, OCH_3 or OCH_2CH_2OH, or, if m designates 2 or 3, X designates OH, and R_4 designates hydrogen, alkyl or halogen, with the proviso that at least one of R_1, R_2 and R_3 is other than hydrogen, and that, if R_1 and R_2 are both other than hydrogen, R_3 designates hydrogen, and

(b) at least one dyestuff of the formula:



(II)

in which R_5 designates hydrogen, amino, alkylamino, NH—alkylene—$(X)_m$, N—$(alkyl)_2$, N—(aliphatic$(X)_m)_2$, or $NHCH_2CH_2NH_2$, R_6 designates hydrogen, OH, alkoxy, O-aliphatic$(X)_m$ or $O(CH_2)_nNH_2$, R_7 designates hydrogen, alkyl or halogen, A designates —Y—(CH_2)—$_n$, —$OCH_2CHOH—CH_2$— or



where R_8 designates hydrogen or methyl, Y designates oxygen or —NH— and n is an integer from 2 to 4, and m, "aliphatic" and X are as defined above, with the proviso that, if Y designates —NH— and R_6 is other than hydrogen, R_5 designates hydrogen, and, if Y is an oxygen atom, R_6 designates hydrogen, each of alkyl, alkoxy, alkylamino and dialkylamino in formulas (I) and (II) above having 1 to 4 carbon atoms, the shade and chromaticity of the colour obtained with the dyestuff(s) of formula (I) and the shade and chromaticity of the colour obtained with the dyestuff(s) of formula (II) being such that $\Delta H+\Delta C$ is less than or equal to 4.5.

4,637,822

COAL-OIL SLURRIES CONTAINING A SURFACTANT

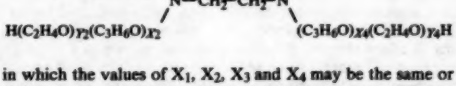
Joseph H. Y. Niu, The Woodlands, Tex., and Irving R. Schmolka, Grosse Ile, Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Nov. 2, 1981, Ser. No. 317,051

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 10 Claims

1. A combustible slurry comprising solid particulate carbonaceous material having particles sufficiently fine so that at least 80 percent pass through a 200 mesh screen, liquid hydrocarbon fuel in the amount of about 45 to 80 percent by weight, about 0.05 to 5 percent by weight of a polyoxyethylene-polyoxypropylene copolymer, and up to about 10 percent by weight of water; said copolymer having the formula:



in which the values of X_1, X_2, X_3 and X_4 may be the same or different, Y_1, Y_2, Y_3 and Y_4 may be the same or different, $Y_1+Y_2+Y_3+Y_4$ give a total oxyethylene content of the molecule of from about 10 to 80 weight percent and X_1, X_2, X_3 and X_4 have values such that the total molecular weight of the molecule is from about 1500 to 30,000.

4,637,823

HIGH TEMPERATURE FURNACE

Michael M. Dach, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,097

Int. Cl.[4] C10J *3/68;* F27D *1/00*

U.S. Cl. 48—77 1 Claim

1. In combination, a high temperature furnace having an outer shell and adapted for being mounted in an upright position,

a temperature resistant lining, comprising

a dome constructed of refractory bricks and located at the upper end of said lining,

a first layer of firebricks having sufficient strength to support said dome and having said dome resting thereon,

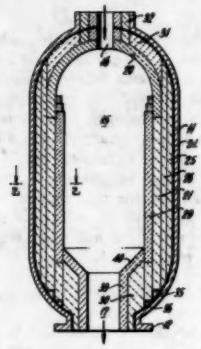
a layer of insulating cement inside of and adjacent to said shell,

a plurality of layers of firebricks between said cement and said first layer of firebricks,

a second layer of freestanding refractory bricks located inside of said first layer of firebricks for withstanding said high temperature,

said second layer comprising replaceable bricks and extend-

ing vertically above the bottom of said dome to permit expansion without any upward thrust to said dome, and



castable insulation filling spaces between said layer of insulating cement and said dome and said other layers of bricks.

4,637,824

PAINT DETACKIFICATION METHOD

Douglas A. Pominville, Edmond, Okla., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 21, 1985, Ser. No. 747,499

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—85 **12 Claims**

1. In a process for detackifying airborne paint particles comprising removing the paint particles from the air by entrapping them in an aqueous wash stream to which has been added, in sufficient quantity to reduce the tackiness of said paint particles, a water-soluble amphoteric metal salt which hydrolyzes to an hydroxide at a pH above 7, a basic salt in sufficient quantity to adjust the pH of the aqueous wash stream to a value in the range of about 7 to 12 and a polymeric flocculating agent, the improvement comprising using as the basic salt an alkali metal silicate and as the polymeric flocculating agent a diallyldialkylammonium halide homopolymer having an average molecular weight of at least 5000.

4,637,825

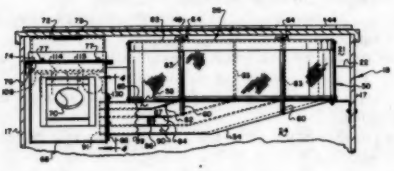
FILTER SYSTEM FOR POWER SWEEPER

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation-in-part of Ser. No. 549,963, Nov. 7, 1983, Pat. No. 4,544,389, and a continuation-in-part of Ser. No. 549,924, Nov. 7, 1983, abandoned, and a continuation-in-part of Ser. No. 657,712, Oct. 9, 1984. This application Dec. 12, 1984, Ser. No. 680,942

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—302 **10 Claims**



1. An air filter unit for apparatus such as a power sweeper, including a debris collection and separation hopper, said filter unit being adapted to be supported in said hopper and including:

a porous media barrier type filter element forming an enclosure defining a clean air chamber and including at least one divider plate means extending across said clean air chamber into a plurality of subchambers with means for supporting said divider plate means in said clean air flow chamber;

support means for said filter element;

means forming an opening through which filtered air flows to said clean air chamber;

a clean air discharge plenum for conducting clean air from said clean air flow chamber to an outlet of said plenum, said plenum being configurered for redirect air flow at substantially a right angle relative to air flow exiting said clean air chamber; and

reverse jet air discharge means disposed adjacent to the outlet of said plenum for discharging jets of pressure air through said plenum to backflush said filter element.

4,637,826

FABRIC FILTER SHAKER ASSEMBLY

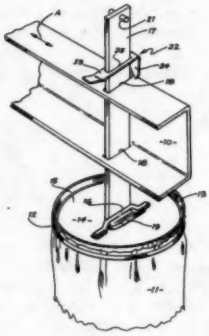
Robert G. Stephenson, Panania, Australia, assignor to James Howden Australia Pty. Limited, Australia

Filed May 21, 1985, Ser. No. 736,351

Claims priority, application Australia, May 21, 1984, PG5090

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—304 **7 Claims**



1. In a mechanical shake type fabric filter having a reciprocable shaker rack, a plurality of filter bag support caps suspended from the shaker rack and a fabric filter bag suspended from each cap, the improvement comprising the connection of each support cap to the shaker rack by a substantially vertically disposed support member, each support member extending through an aperture in the shaker rack and having at its lower end connection means releasably connected to the support cap, and positioning means being provided to releasably retain the support member in at least any one of a number of desired vertical positions relative to the shaker rack, characterized in that the positioning means comprises only a spring clip formed of spring steel and slidably disposed on the support member, the spring clip being of an inverted "V" shape having two arms extending from the apex, the support member extending through an aperture in one arm and the other arm having its free end positioned out of alignment with an axis of symmetry of the aperture so that upon that free end contacting the shaker rack the clip will be caused to deform and the side walls of the aperture frictionally engage the support member.

4,637,827
PARISON TRANSFERRING MEANS

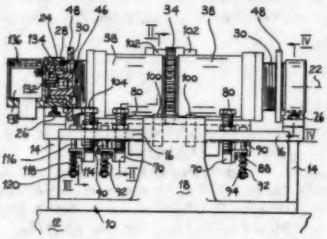
Hermann H. Nebelung, Zurich; Robert Huber, Wettingen, and Fritz Futterknecht, Zurich, all of Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 4, 1985, Ser. No. 805,153

Claims priority, application United Kingdom, Dec. 4, 1984, 8430531

Int. Cl.[4] C03B 9/40

U.S. Cl. 65—235 8 Claims



1. Parison transferring means for use in transferring glass parisons from a parison forming mould of a glassware manufacturing machine to a further mould of the machine in which the parison is formed into an article of glassware, or to further transferring means operable to transfer the parison to the further mould, the transferring means comprising, a shaft mounted on a supporting frame for turning movement about a horizontal longitudinal axis of the shaft, two neck ring supports mounted on the shaft to turn therewith and for sliding movement along the shaft towards or away from one another, moving means operable to move the neck ring supports towards or away from one another as aforesaid so that one or more split neck rings, half of each ring being supported by each support, can grip or release parisons, and turning means operable to turn the shaft back and forth along an arc about the horizontal axis between a position at which a neck ring supported by the supports can grip a parison in the parison forming mould and a position at which the neck ring can release a parison into the further mould or into further transferring means operable to transfer the parison to the further mould, wherein the transferring means comprises adjustable stops mounted on the supporting frame and operable to determine the end positions of the movement along the arc by engagement with projections of the shaft or of the supports.

4,637,828
PLANT GROWTH REGULATORS

Ernst-Friedrich Schilze, Hofheim am Taunus; Helmut Bürstell, Frankfurt am Main, and Erwin Hacker, Hocheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

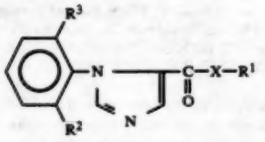
Filed Jun. 3, 1985, Ser. No. 740,286

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420832

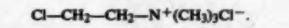
Int. Cl.[4] A01N 43/50, 33/12

U.S. Cl. 71—76 9 Claims

1. A plant growth regulator consisting essentially of a compound (I)



wherein X is O or S; R' is hydrogen, (C_1–C_6)-alkyl, a metal cation, or an ammonium cation; R^2 and R^3 are the same or different (C_1–C_4)-alkyl, or when R^1 is not a cation, (I) is an acid addition salt, a complex salt, or a quaternization product of such a compound, in combination with a synergistically effective amount of compound (II) of the formula



4,637,829
SULFONYLUREAS

Rolf Schurter, Binningen, Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

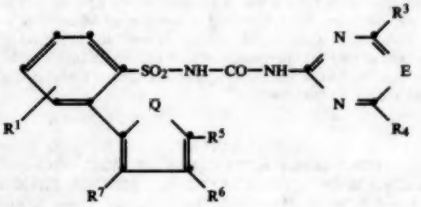
Filed Apr. 15, 1985, Ser. No. 723,233

Claims priority, application Switzerland, Apr. 27, 1984, 2062/84

Int. Cl.[4] C07D 239/69, 239/42; A01N 43/66, 43/54

U.S. Cl. 71—90 10 Claims

1. An N-(2-heterocyclylphenylsulfonyl)-N'-pyrimidinylurea of the formula



wherein

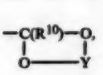
E is methine —CH=,

Q is oxygen or sulfur,

R^1 is hydrogen or chlorine,

R^3 and R^4 are each independently of the other methyl or methoxy,

R_5 is C_1–C_6alkyl substituted by cyano, $—COR^{10}$, $—C(R^{10})=NOR^{11}$, —CH=CH—$COOR^{12}$ or



R^6 and R^7 are hydrogen,

R^{10} is hydrogen, unsubstituted C_1–C_{10}alkyl or C_2–C_4alkenyl,

R^{11} is unsubstituted C_1–C_6alkyl,

R^{12} is methyl and

Y is C_2–C_3alkylene.

6. A method of controlling undesired plant growth, which method comprises applying to the plants or to the locus thereof an effective amount of a compound of claim 1, or of a composition containing such a compound.

4,637,830
HERBICIDAL CONCENTRATES

Ross M. W. Dyer, Harston, and Edward Nowak, Histon, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 368,497, Apr. 15, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,413

Claims priority, application United Kingdom, Apr. 24, 1981, 8112773

Int. Cl.[4] A01N 37/34, 25/00

U.S. Cl. 71—105 10 Claims

1. An aqueous liquid concentrate which comprises at least two herbicides, said herbicides comprising

(a) a first herbicide of low water solubility which herbicide is selected from the group consisting of
(i) a 2,6-diiodo-4-cyanophenyl alkanoate having up to 12 carbon atoms in the alkanoate group;
(ii) a 2,6-dibromo-4-cyanophenyl alkanoate having up to 12 carbon atoms in the alkanoate group; and
(iii) a mixture of (i) and (ii); and
(b) a second herbicide which is a salt of a carboxylic acid in which
(i) the cation is selected from the group consisting of the sodium, potassium, ammonia, dimethylamine, diethylamine, monoethanolamine, diethanolamine, triethanolamine and morpholine cations, and
(ii) the anion is selected from the group consisting of the 2,3,6-trichlorobenzoic acid; 3,6-dichloro-2-methoxybenzoic acid; 2,4-di chloro-phenoxyacetic acid; 2,4,5-trichloro Phenoxyacetic acid; 2-methyl-4-chlorophenoxy acetic acid; 2-(2-methyl-4-chlorophenoxy) propionic acid; 2-(2,4-dichlorophenoxyl)propionic acid; 2-(2,4,5-trichlorophenoxy) propionic acid; 4-(2-methyl-4-chlorophenoxy) butyric acid; and 4-(2,4-dichlorophenoxy)butyric acid anions;

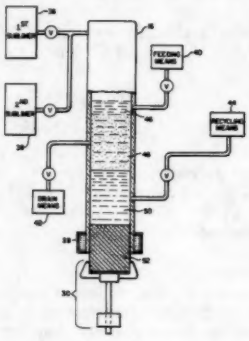
said first herbicide being present in said concentrate in an amount which is herbicidally effective and at a concentration which exceeds the normal solubility of said first herbicide in water but being fully dissolved in an aqueous solution of from a threefold to a twelvefold excess, relative to the amount by weight of said first herbicide, of said second herbicide so as to produce a clear, stable, homogeneous concentrate of said first and second herbicides.

4,637,831

PROCESS FOR REDUCTION OF ZIRCONIUM, HAFNIUM OR TITANIUM USING A ZINC OR TIN SEAL

Richard A. Stoltz, Murrysville Boro, Pa., and Young J. Kwon, Fruit Heights, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 30, 1985, Ser. No. 739,418
Int. Cl.[4] C22B *34/10*
U.S. Cl. 75—84.5 **17 Claims**



1. In a process of the type wherein a chloride of zirconium, hafnium or titanium is reduced to produce a product metal, the improvement comprising:

a. establishing a layer of a seal metal selected from the group consisting of zinc, zinc together with product metal, tin and tin together with product metal in a vessel, said seal metal layer having an upper molten portion and a lower solid portion, said lower solid portion being located adjacent to a cooling means;

b. establishing a layer of molten magnesium chloride on top of said seal metal;

c. establishing a layer of molten magnesium on top of said layer of magnesium chloride;

d. introducing gaseous chloride of the product metal above said magnesium, thereby causing a reaction which produces product metal chunks which settle through said layers of molten magnesium, molten magnesium chloride and molten seal metal;

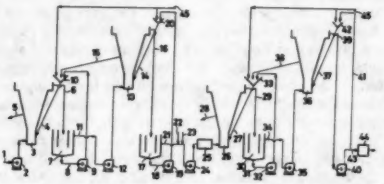
e. withdrawing a lower part of said solid seal metal from said vessel and causing a portion of the molten seal metal to be relocated adjacent to said cooling means, whereby the portion of the molten seal metal relocated adjacent to the cooling means solidifies and maintains a seal at the bottom of the vessel while product metal chunks are trapped within the solidified seal metal and can be later withdrawn from said vessel together with solidified seal metal.

4,637,832

PROCESS FOR PURIFYING SOLUTIONS OF ZINC SULPHATE

Sergio Cammi, Rome; Arturo D'Este, Venice, and Alessandro Pescetelli, Rome, all of Italy, assignors to SAMIM Societa Azionaria Minero-Mettallurgica, S.p.A., Rome, Italy

Filed Aug. 1, 1984, Ser. No. 636,815
Claims priority, application Italy, Aug. 2, 1983, 22388 A/83; Feb. 10, 1984, 19556 A/84
Int. Cl.[4] C01G *9/06*
U.S. Cl. 75—109 **20 Claims**



1. A process for purifying aqueous solutions of zinc sulphate containing one or more metal impurities selected from the group: Cu, Cd, Tl, Ni, Co. Ge, As, and Sb, which comprises cementing out the impurities by using zinc dust and an activator selected form the group consisting of Cu-As and Cu-Sb, wherein the cementation is carried out in at least one stage and at least two reactors disposed in a series or in parallel to each other, having a bottom portion of cylindrical shape, a cone frustum shaped intermediate portion and a top portion which is enlarged relative to the intermediate cone portion, the aqueous solutions of zinc sulphate containing the metal impurities being fed to the side wall of the cylindrically shaped portion with a speed in a range of from 0.02 to 0.07 m/s, and the zinc dust having a grit size of from 0.01 to 1 mm and activator being fed to the side wall of the cylindrically shaped portion above the feeding inlet of the zinc sulphate solution, and operating with a retention time within the range of from 3 to 12 minutes.

4,637,833

INHIBITING CORROSION: BENZYLSULFINYLACETIC ACID OR BENZYLSULFONYLACETIC ACID

Merlin R. Lindstrom, and Harold W. Mark, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jun. 27, 1985, Ser. No. 749,379
Int. Cl.[4] C04B *9/02*; C09K *3/00*
U.S. Cl. 106—14.13 **12 Claims**

1. A method of inhibiting the corrosiveness of acidic systems which comprises incorporating into the system a corrosion inhibiting amount of at least one of benzylsulfinylacetic acid and benzylsulfonylacetic acid.

4,637,834

AQUEOUS PROTEIN SOLUTIONS WHICH ARE STABLE TOWARDS DENATURING, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Horst Thurow, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 629,847, Jul. 11, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 825,965

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3325223

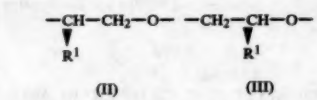
Int. Cl.[4] C08L 89/00

U.S. Cl. 106—124 8 Claims

1. An aqueous solution of a protein with a molecular weight above 8,500 daltons, which contains a compound of the formula I

$$R^2O-X_n-R^3 \quad (I)$$

in which X_n is a chain of n members of the formula II or III



(II) (III)

in any desired sequence,

n denotes 2 to 200, preferably 4 to 100 and

R^1 denotes hydrogen, methyl or ethyl, it being possible for the radicals R^1 to be identical or different, but R^1 being hydrogen in more than 75% of the chain members, and

R^2 and R^3 are identical or different and denote hydrogen or an organic radical,

such that the protein is protected from adsorption at interfaces and protected against denaturing and precipitation.

4,637,835

METHODS OF HYDROLYZING CELLULOSE TO GLUCOSE AND OTHER (POLY)SACCHARIDES

Richard T. Nagle, Upper Montclaire, N.J., assignor to Power Alcohol, Inc., Hasbrouck Heights, N.J.

Filed Jun. 28, 1985, Ser. No. 774,071

Int. Cl.[4] C13K 1/02

U.S. Cl. 127—37 3 Claims

1. A method of hydrolizing cellulose to glucose and other saccharides, said method comprising bringing to a reaction area a feed mixture consisting essentially of at least one alphacellulose containing material, water, a calcium chloride catalyst present in an amount of from 5 to 27.5% by weight on a total solids basis, said calcium chloride catalyst being in an aqueous solution, and a minor amount of hydrochloric acid (HCl), said HCl being present in amount ranging from approximately 0.01 to 0.5% by weight of said calcium chloride catalyst aqueous solution, adjusting the temperature of said feed mixture to between 150° C. to 250° C., at a pressure of from 160 psig to 800 psig, for a finite retention time of up to one minute in the reaction area to convert the alphacellulose containing material to said glucose and other saccharides.

4,637,836

PROFILE CONTROL OF BORON IMPLANT

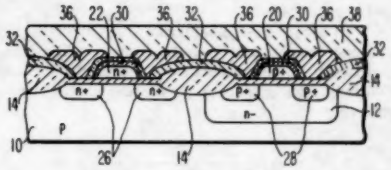
Doris W. Flatley, Hillsboro Township, Somerset County, and Sheng T. Hsu, W. Windsor Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 23, 1985, Ser. No. 778,986

Int. Cl.[4] H01L 21/265, 21/26

U.S. Cl. 148—1.5 7 Claims

1. In a process of ion implanting a silicon structure having a thickness of from about 300 nm to about 700 nm overlying a layer of silicon dioxide with a dosage of boron ions of at least about 10^{15} ions per square centimeter thereby rendering the structure p type conductive and annealing said implant, the improvement which comprises doping said structure prior to the boron implant with sufficient phosphorus ions to substantially prevent the migration of the boron ions into the silicon dioxide layer during annealing.



4,637,837

PROCESS FOR BORIDING METALS AND METAL ALLOYS BY MEANS OF SOLID BORIDING AGENTS

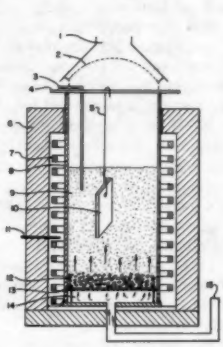
Alfred G. von Matuschka, Sauerlach, and Norbert Trausner, Betzigau, both of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 747,019

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431044

Int. Cl.[4] C23C 9/04

U.S. Cl. 148—6 8 Claims



1. A process for boriding metals and metal alloys using a solid boriding agent comprised of materials that yield boron, said process comprising conducting said boriding in a fluidized bed at a temperature of from about 580° to about 1300° C. using as the solid boriding agent material in granular form and comprised essentially of spherical particles having a particle size of from about 0.025 to about 5.0 mm.

4,637,838

PROCESS FOR PHOSPHATING METALS

Werner Rausch, Oberursel, and Gerhard Mueller, Hanau am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft, A.G., Frankfurt, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,463

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408577

Int. Cl.[4] C23F 7/10

U.S. Cl. 148—6.15 Z 6 Claims

1. A process for phosphating metals, in particular steel and galvanized steel, by a spray method using an aqueous acidic phosphating solution containing an accelerator, zinc, wherein

the metal surface is brought into contact with a phosphating solution which contains
0.2 to 0.5 g/l of Zn^{++}
8 to 20 g/l of P_2O_5
at least one accelerator selected from the group consisting of:
0.5 to 0.2 g/l of NO_2 and
0.1 to 1 g/l of nitrobenzenesulfonate
and at least one activator from the group consisting formate, nitrilotriacetate, trichloroacetate and ethylenediaminetetraacetate whereby a uniform coating in the range of 0.8 to 2.5 g/m^2 is obtained.

4,637,839

TREATING AUTODEPOSITED COATING WITH CR COMPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 855,748, Nov. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 609,017, Aug. 29, 1975, abandoned. This application Sep. 4, 1981, Ser. No. 299,496
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.[4] C23C *22/24, 22/67*
U.S. Cl. 148—6.2 **5 Claims**

1. A coating process for forming on a metallic surface an autodeposited coating of the type which in fused form tends to have a glossy appearance comprising forming on the metallic surface an unfused autodeposited coating by contacting the metallic surface with an autodepositing coating composition comprising an aqueous acidic solution prepared from a ferric iron-containing compound and HF, and including dispersed resin particles, modifying the properties of the coating so that it has a uniformly matte appearance and improved corrosion resistance in its fused form by contacting the unfused coating with an acidic aqueous chromium-containing composition having a pH of no greater than about 4 and consisting essentially of the following dissolved ingredients:

(A) ammonium, potassium or sodium dichromate in an amount equivalent to about 0.3 to about 3 g/l of Cr^{+6};

(B) formaldehyde-reduced chromic acid in an amount equivalent to about 0.3 to about 3 g/l of chromium, with about 50 wt. % of the chromium being in reduced form; and

(C) at least about 0.06 g of phosphoric acid for each gram of total chromium in said mix;

and thereafter fusing the unfused coating.

4,637,840

COATED ALUMINUM-ZINC ALLOY PLATED SHEET STEEL

Haruki Fujii; Shoji Ikada, both of Hyogo; Akimitsu Fukuda, Chiba, and Yasuo Okumura, Aichi, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 713,152
Claims priority, application Japan, Mar. 21, 1984, 59-54789
Int. Cl.[4] C23C *22/26*
U.S. Cl. 148—6.2 **5 Claims**

1. A process for cold forming the surface of aluminum-zinc alloy plated sheet steel comprising (1) contacting the surface with an aqueous composition of a water dispersible or water soluble resin having an acid value of from 10 to 200, from 0.2 to 10 parts of hexavalent chromium per 100 parts of solid resin and exhibiting a pH value of from 3 to 10, (2) thereafter drying the coating and (3) subjecting the sheet to cold forming without the use of a lubricating oil.

4,637,841

SUPERPLASTIC DEFORMATION OF DUPLEX STAINLESS STEEL

Yasuhiro Maehara, Kobe, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 21, 1985, Ser. No. 747,433
Claims priority, application Japan, Jun. 21, 1984, 59-128150; Jun. 21, 1984, 59-128151
Int. Cl.[4] C22C *8/00*
U.S. Cl. 148—12 E **12 Claims**

1. A superplastic deforming process of a duplex stainless steel, which comprises the steps of:

heating a ferrite+austenite duplex stainless steel to a temperature between the alpha-temperature and a temperature 200° C. lower than the alpha-temperature, the heating temperature being 1000° C. or higher;

water quenching or force-cooling the duplex stainless steel to a temperature of 500° C. or lower;

reheating it to a temperature of between 700° C. and a temperature 200° C. lower than the alpha-temperature; and

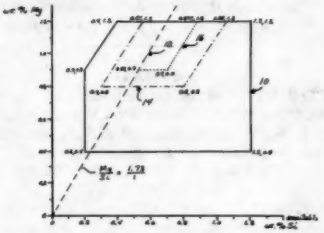
plastic deforming the thus-pretreated duplex stainless steel at a strain rate of 1×10^{-3}–1×10^{-1} S^{-1}.

4,637,842

PRODUCTION OF ALUMINUM ALLOY SHEET AND ARTICLES FABRICATED THEREFROM

Paul W. Jeffrey, and Gilles Marchand, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Mar. 13, 1984, Ser. No. 588,945
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A **16 Claims**



1. A process for producing aluminum alloy sheet of predetermined final gauge, comprising the steps of:

(a) providing a sheet article, at an intermediate gauge from which a reduction of between about 25% and about 71% is required to achieve said final gauge, of a heat-treatable Al-Mg-Si alloy having a major content of Al and a minor content of Mg and available Si such that on a rectangular graph of % Mg plotted against % available Si the point representing said minor content lies within the area of a pentagon defined by the coordinates 0.2% Si, 0.4% Mg; 0.2% Si, 0.9% Mg; 0.4% Si, 1.2% Mg; 1.2% Si, 1.2% Mg; and 1.2% Si, 0.4% Mg;

(b) solution-heat-treating the sheet article at said intermediate gauge by successively heating and quenching the article, for effecting at least substantially complete solution of the Mg and the Si therein;

(c) after quenching, and without intervening heat treatment, naturally aging the sheet article by maintaining the sheet article at ambient temperature for at least about one day;

(d) after natural aging, and without intervening heat treatment, cold rolling the sheet article to said final gauge; and

(e) artificially aging the cold rolled sheet article at said final gauge for increasing the yield strength thereof by heating the article to a predetermined temperature, beginning at a time To, under conditions such that

(i) achievement of the maximum yield strength attainable

by artificial aging of said final gauge cold rolled sheet article at said temperature requires continuing the heating until a time T_2 later than T_o, and

(ii) the maximum value of % elongation attainable by artificial aging of said final-gauge cold rolled sheet article at said temperature following the extent of cold reduction performed in step (d) would be achieved by continuing the heating until a time T_1 later than T_o but earlier than T_2 and terminating the heating at T_1;

wherein the improvement comprises:

(f) continuing the heating in step (e) at least until T_1 and terminating the heating at a time prior to T_2 and such that the % elongation value of the article after artifical aging is within 20% of said maximum value of % elongation.

4,637,843

CORE OF A NOISE FILTER COMPRISED OF AN AMORPHOUS ALLOY

Suguru Takayama, Tokyo, and Masao Shigeta, Urayasu, both of Japan, assignors to TDK Corporation, Tokyo, Japan

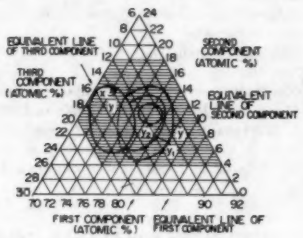
Continuation-in-part of Ser. No. 592,308, Mar. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 492,243, May 6, 1983, abandoned. This application May 3, 1985, Ser. No. 730,140

Claims priority, application Japan, May 6, 1982, 57-75915; Nov. 5, 1983, 58-206898; Oct. 1, 1984, 59-204141

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.⁴ H01F *17/06*

U.S. Cl. 420—73 **24 Claims**


EQUIVALENT LINE OF THIRD COMPONENT
SECOND COMPONENT (ATOMIC %)
THIRD COMPONENT (ATOMIC %)
EQUIVALENT LINE OF SECOND COMPONENT
FIRST COMPONENT (ATOMIC %)
EQUIVALENT LINE OF FIRST COMPONENT

1. A core of a noise filter comprising a coiled thin strip of an amorphous magnetic alloy which partially contains precipitated crystals and essentially has the following composition:

$$M_xMn_y(Si_tB_qC_l)_z$$

wherein M is Fe or Fe together with at least one transition metal element other than Fe, $x+y+z=100$ atomic %, y is from 0.1 atomic % to 10 atomic %, z is from 16 atomic % to 32 atomic %, $t+q+l=1$, t is from 0.20 to 0.80, l is from 0.0001 to 0.05, the ratio l/q is from 0.01 to 0.4, and $20t+6 \leqq z \leqq -50t+67$.

4,637,844

METHOD FOR HEAT TREATING FERROUS PARTS

George D. Pfaffmann, Farmington, Mich., assignor to Tocco, Inc., Boaz, Ala.

Filed Jul. 8, 1985, Ser. No. 752,550

Int. Cl.⁴ C21D *1/42*

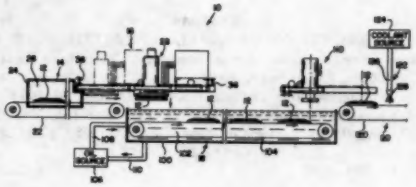
U.S. Cl. 148—144 **6 Claims**

1. A method of heat treating ferrous annular workpieces comprising:

preheating the entire workpiece to an elevated temperature around the M_s temperature thereof;

inductively further heating thin peripheral surface portions of the workpiece to the austenizing temperature thereof and to a substantial depth while leaving the remaining core portion of the workpiece substantially at the said elevated temperature;

rapidly cooling the inductively heated peripheral surface portions of the workpiece to a predetermined transformation temperature around the said elevated temperature at a rate sufficiently rapid to prevent transformation of the austenite of the austenitized said peripheral surface portions to intermediate matrix phases during the said rapid cooling thereof;



maintaining the entire said workpiece at the said predetermined transformation temperature until the austenite of the said austenitized workpiece surface portions is completely transformed to lower bainite or partially transformed to martensite, depending on said transformation temperature being respectively above, or at or below, the M_s temperature of the workpiece material; and

then cooling the workpiece to ambient temperature below the M_f temperature of the workpiece material.

4,637,845

METHOD OF MANUFACTURING SEMICONDUCTOR LIGHT EMITTING DEVICE

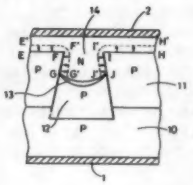
Ryoichi Hirano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 25, 1984, Ser. No. 664,880

Claims priority, application Japan, Nov. 9, 1983, 58-211952

Int. Cl.⁴ H01L *21/208, 21/225*

U.S. Cl. 148—171 **8 Claims**



1. A method of manufacturing a semiconductor light emitting device wherein an exposed surface and a p-n junction displaced therefrom are in a non-intersecting relationship comprising the steps of:

providing a semiconductor substrate (**10, 11**) having a surface layer of a first conductivity type,

forming a stripe shaped groove (**15**) in said semiconductor substrate of said first conductivity type,

forming successively a first semiconductor layer (**12**) of said first conductivity type and a second semiconductor layer (**13**) of either conductivity type in regions including the inner portion of said groove, and then forming a third semiconductor layer (**14**) of said second conductivity type on said second semiconductor layer and in regions inside and outside said groove, said third semiconductor layer being directly grown on said surface layer of the substrate and forming a p-n junction interface therein, and

diffusing the impurity of said first conductivity type from said surface layer of the semiconductor substrate into said

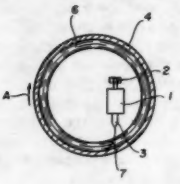
third semiconductor layer by the growth process of the respective semiconductor layers inside and outside said groove, so that the p-n junction interface moves from the inner surfaces of said groove and said surface layer into said third semiconductor layer.

4,637,846

NICKEL-TITANIUM-BERYLLIUM ALLOY WIRE

Kazuo Sawada, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 508,511, Jun. 28, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,625
Claims priority, application Japan, Jun. 29, 1982, 57-113420
Int. Cl.[4] C22C *19/03*
U.S. Cl. 148—402 4 Claims



1. A nickel-titanium-beryllium alloy wire produced by the process comprising the steps of:

preparing a nickel-titanium-beryllium alloy having a shape memory effect consisting essentially of 50 to 60 % by weight nickel, 40 to 50% by weight titanium, and beryllium substituted for a portion of the nickel or titanium in quantities of 0.005 to 0.5% by weight,

bringing said nickel-titanium-beryllium alloy to a moltan state,

jetting a melt of said nickel-titanium-beryllium alloy through an orifice having a circular cross-section into a laminar flowing cooling liquid said alloy remaining in a molten state upon exiting said orifice, and

cooling and solidifying said nickel-titanium-beryllium alloy in said laminar flowing cooling liquid from its molten state into a fine wire having a circular cross-section at an average cooling rate in the range of from 10^2 to 10^4° C./sec said resulting alloy wire retaining said shape memory effect.

4,637,847

CHEMICAL PASSIVATION OF AMORPHOUS BORON POWDER

Eria G. Nieder, Manassas, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Dec. 21, 1983, Ser. No. 563,969
Int. Cl.[4] C06B *45/32*
U.S. Cl. 149—6 26 Claims

1. A method for treating amorphous boron powder comprising:

(a) reacting the boron powder with an alcohol to form a borate coated boron powder; and

(b) combining the reacted boron powder with a hydroxyl-functional pre-polymer, whereby there is no reaction between the polymer and the reacted boron powder.

4,637,848

HIGH DENSITY GEL EXPLOSIVE

David A. Ciaramitaro, Benson, Ariz.; David J. Speltz, Spring Valley, Calif., and Jack M. Moore, Benson, Ariz., assignors to Apache Powder Company, Benson, Ariz.

Filed Mar. 14, 1986, Ser. No. 839,757
Int. Cl.[4] C06B *45/02*
U.S. Cl. 149—21 16 Claims

1. A method for producing a water gel explosive composition, said method comprising:

combining a water solution of an oxygen-supplying salt and a gelling agent with an amount of comminuted paper sufficient to increase the viscosity of the mixture to a preselected level while continuously mixing the resulting combination;

thereafter adding an amount of a densifying agent sufficient to increase the specific gravity and introducing a preselected amount of an inert sensitizer to the combination; and

packing the resulting composition into containers, whereby the densifying agent remains substantially uniformly dispersed in the explosive composition.

4,637,849

WATERPROOF AMMONIUM NITRATE FUEL OIL EXPLOSIVES

William F. Harris, Jr., Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,863
Int. Cl.[4] C06B *33/04*
U.S. Cl. 149—43 10 Claims

1. A waterproof explosive composition consisting essentially of a nonaqueous blend of:

(a) an inorganic oxidizing salt;

(b) fuel oil; and

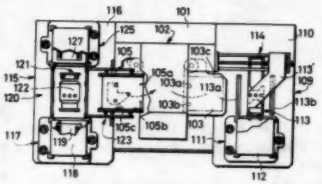
(c) a polygalactomannan plus crosslinker wherein (a), (b) and (c) are present in the amount of about 83 to about 94.5 weight percent (a), about 4 to about 7 weight percent (b), and about 1.5 to abuot 10 weight percent (c), said percentages being based on the total weight of (a), (b) and (c).

4,637,850

PRESS APPARATUS FOR PLANAR MEMBERS

Kazunori Suzuki, Yokohama; Hiroo Katsuta, Kawasaki, and Yuki Toriumi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 670,008
Claims priority, application Japan, Nov. 22, 1983, 58-218745; Nov. 29, 1983, 58-223138
Int. Cl.[4] B30B *15/30, 15/32*
U.S. Cl. 156—60 16 Claims



5. A press apparatus for planar members having:

means for conveying a first planar member;

means for stopping and positioning said first planar member at the terminal end of the conveyance;

a chuck;

means for shifting said first planar member to said chuck;

means for displacing said first planar member to a predetermined position on said chuck;

a first transfer table for transferring said chuck to a press position;

a second transfer table for transferring a second planar member to the press position;

means for aligning said first and second planar members;

means for effecting the parallel feeding of said first and second planar members; and

means for pressing said first and second planar members with a predetermined pressure.

15. A method for pressing a planar member comprising the following steps:

(a) providing a press apparatus;

(b) rotatively transferring a first planar member to a press position of said apparatus employing a first transfer table;

(c) rotatively transferring a second planar member to said press position of said apparatus employing a second transfer table substantially simultaneously with the transfer of said first planar member to the press position;

(d) aligning said first and second planar members;

(e) effecting parallel feeding of said first and second planar members; and

(f) pressing said first and second planar members with a predetermined pressure employing said apparatus, wherein said planar members are rotatively transferred to the press position by rotatively moving said first and second transfer tables to the press position.

4,637,851

METHOD FOR THE PREPARATION OF A LAMINATE

Susumu Ueno; Kouiti Kuroda, both of Ibaraki; Hirokazu Nomura, Tokyo, and Shigeru Tateno, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Otemachi, Japan

Filed Jan. 17, 1986, Ser. No. 819,694

Claims priority, application Japan, Jan. 25, 1985, 60-11885; Jan. 25, 1985, 60-11886

Int. Cl.[4] B32B *31/00*; B29C *17/08*

U.S. Cl. 156—272.6 **7 Claims**

1. A method for the preparation of a laminate based on fabric sheets of aromatic polyamide fibers which comprises the steps of:

(a) subjecting the fabric sheet of the aromatic polyamide fibers to exposure to an atmosphere of low temperature plasma under continuous introduction of a plasma-supporting gas into the atmosphere under a gaseous pressure in the range from 0.05 to 20 Torr generated by impressing a high-frequency electric power between a grounded electrode and an input electrode;

(b) impregnating the thus plasma-treated fabric sheet with a resinous binder selected from the group consisting of polyimide resins and epoxy resins to give a resin-impregnated prepreg sheet;

(c) laying a plural number of the resin-impregnated prepreg sheets one on the other into a pile; and

(d) pressing the pile of the resin-impregnated prepregs at an elevated temperature so as to convert the prepregs into an integral laminate.

4,637,852

NEOALKOXY TITANATE IN HIGH DENSITY MICA LAMINATES

Dennis J. Sklarski, Deerfield, N.H., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 663,535, Oct. 22, 1984. This application Sep. 3, 1985, Ser. No. 772,104

Int. Cl.[4] B32B *31/26*

U.S. Cl. 156—307.4 **3 Claims**

1. A method of making mica composite laminates comprising:

individually impregnating a plurality of mica papers with about 5 percent to about 14 percent by weight of a polysiloxane binder containing about 1 percent to about 4 percent by weight of a neoalkoxy titanate and about 0.5 percent to about 2 percent by weight of a naphthenate in an aromatic solvent, removing the aromatic solvent, stacking the solvent free mica papers, one on top of another, and densifying under pressure and temperature until the binder is cured, wherein the composite has a density greater than about 1.5 g/cc and can withstand immersion in boiling water for 1 hour without delaminating.

4,637,853

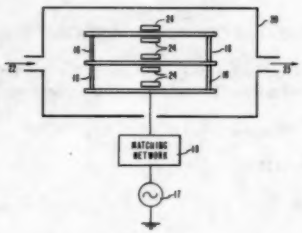
HOLLOW CATHODE ENHANCED PLASMA FOR HIGH RATE REACTIVE ION ETCHING AND DEPOSITION

Bruce Bumble, Croton-on-Hudson; Jerome J. Cuomo, Lake Lincolndale; Joseph S. Logan, Poughkeepsie, and Steven M. Rossnagel, White Plains, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,762

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*

U.S. Cl. 156—345 **4 Claims**



1. In an RF sputter/etching system including an evacuated chamber, the improvement which comprises a partially enclosed electrode structure which produces a pronounced hollow cathode glow within the electrode structure when energized with an RF voltage source,

means for supplying one side of an RF voltage source of up to 300 volts peak to the electrode structure,

said electrode structure comprising a single plate hollow cathode electrode structure having on at least one side thereof a plurality of small individual hollow cathode chambers defined by side walls and a bottom having a uniform cross-sectional size and shape, the tops being open to the system chamber and wherein the side walls are substantially perpendicular to the bottoms,

said individual chambers having an aspect ratio defined as the depth/longest cross-sectional dimension of an individual chamber of at least 1.5,

means for supplying an ionizeable gas to the system from outside the electrode structure, and

means for supporting workpieces adjacent to the hollow cathode glow within the electrode structure for sputter-/etching.

4,637,854

METHOD FOR PRODUCING GAAS SINGLE CRYSTAL

Tsuguo Fukuda, Yokohama, and Kazutaka Terashima, Ebina, both of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,091

Claims priority, application Japan, Jan. 18, 1983, 58-5181; May 7, 1983, 58-78899; May 7, 1983, 58-78900

Int. Cl.[4] C30B *15/22, 27/02*

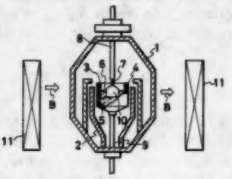
U.S. Cl. 156—607 **7 Claims**

1. A method for the production of a GaAs single crystal by the liquid-encapsulated Czochralski method, which comprises the steps of:

applying a magnetic field to a melt of encapsulated GaAs;

bringing a seed crystal into contact with said encapsulated

melt of GaAs as said magnetic field is being applied, said magnetic field having a sufficient intensity which enables the temperature fluctuations in the neighborhood of the



solid-liquid boundary in said encapsulated melt to be repressed to within 1° C.; and

pulling said seed crystal at a rate of up to about 40 mm/hour, thereby achieving crystal growth.

4,637,855

PROCESS FOR PRODUCING CRYSTALLINE SILICON SPHERES

David E. Witter, Richardson, and Jules D. Levine, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1985, Ser. No. 728,959

Int. Cl.[4] C30B *00/00*

U.S. Cl. 156—616 R **9 Claims**

1. A process for forming crystalline spheres of a crystallizable material, comprising the steps of:

forming a layer of a paste of the crystallizable material on a planar surface of a substrate capable of withstanding temperatures in excess of the melting point of the crystallizable material;

patterning said layer on the surface of said substrate;

heating said patterned layer beyond the melting point of said crystallizable material and supplying an atmosphere which can react with said crystallizable material to form a coating that does not wet said layer thus causing said material to bead as coated spheres at the surface of said patterned layer;

cooling said crystallizble material thus causing the beaded crystallizable material to crystallize into crystalline spheres; and

removing said crystalline spheres from the surface of said patterned layer of crystallizable material.

4,637,856

APPARATUS AND PROCESS FOR ETCHING FLUOROPLASTICS

Frank Lombardo, Warren; Edward L. Jernigan, Bristol, both of R.I., and Paul Furze, Fall River, Mass., assignors to Dixon Industries Corporation, Bristol, R.I.

Filed Dec. 12, 1985, Ser. No. 808,073

Int. Cl.[4] B29C *17/08*; B44C *1/22*

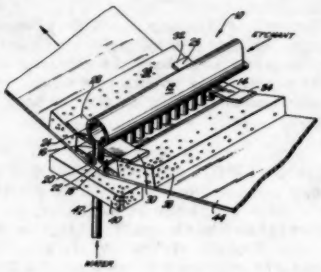
U.S. Cl. 156—637 **2 Claims**

1. An apparatus for etching one surface of a fluoroplastic substrate, the apparatus comprising:

a. an etchant distribution means adapted to be placed over the surface of the fluoroplastic substrate to be etched, said etchant distribution means comprised of:

(1) an annularly shaped main body having a hollow core extending therethrough along its longitudinal axis, one end of the hollow core defining an inlet for the main body, the main body also having a series of openings therein along its longitudinal axis and in parallel alignment with one another.

(2) a series of annular shaped extension legs attached to said main body, each of the extension legs having a hollow channel extending therethrough along its longitudinal axis and being in parallel alignment with one another, the longitudinal axis of each of said extension legs being transverse relative to the longitudinal axis of said main body, each of the hollow channels having an enlarged cross-sectional area at one end thereof, which defines an exit means for said etchant, and having an inlet at its other end in communication with the hollow



core of said main body through a respective one of said openings in the main body; and

(3) first and second means for holding first and second sponge means adjacent to and on opposite sides of the main body said first and second sponge means having longitudinal axes which are in substantial parallel alignment with the longitudinal axis of said main body.

b. a water distribution means adapted to be placed under the surface of the fluoroplastic substrate which is not being etched, said water distribution means comprised of:

(1) a retaining sponge means adapted to be placed in substantial contacting relationship with the entire surface of the fluoroplastic substrate which is not being etched and supply fresh water to said surface;

(2) conduit means for feeding a supply of fresh water to said retaining sponge means, said conduit means adapted for connection to said retaining sponge means and to a source of water.

4,637,857

PROCESS FOR THE REMOVAL OF RESIDUAL CONSTITUENTS

Rolf Brockmann, Duesseldorf; Clemens Casper, Krefeld; Walter Damsky, Krefeld; Axel Lippert, Krefeld, and Johannes O. Sajben, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 452,540, Dec. 23, 1982, abandoned, which is a continuation of Ser. No. 61,207, Jul. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 900,678, Apr. 27, 1978, abandoned. This application Nov. 14, 1984, Ser. No. 671,263

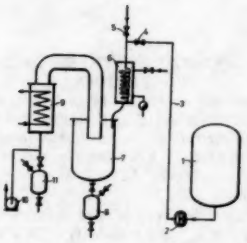
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719968

Int. Cl.[4] B01D *1/14, 1/22*

U.S. Cl. 159—47.1 **3 Claims**

1. A process for stripping a residual component from a liquid having a viscosity of from 300 to 10,000 poises comprising:

flowing the liquid in the form of a ring flow supported by a gas stream in the center of the ring through a heated tube having a continuous helix shape and a tube diameter to helix diameter ratio of from 0.1:1 to 0.04:1 into a separator vessel; and adding to said gas stream from 10 to 90%, by weight, of externally generated steam and/or an inert gas at an adjusted pressure of



from 50 m bars to 1 bar in said separator vessel for a gas and/or steam velocity in said tube of from 100 m/sec to the speed of sound, wherein said added gas and/or steam is sufficient in quantity and velocity such that a circular flow between the wall of the tube and the surface of the liquid is developed transversely thereof providing thorough transverse mixing of the liquid ring flow.

4,637,858

PYROLYSIS OF BLACK LIQUOR AT HIGH TEMPERATURES USING RADIANT ENERGY

Edwin Matovich, Dana Point, Calif., and Robert J. Spannuth, Washougal, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 25, 1985, Ser. No. 705,156

Int. Cl.⁴ D21C *11/12, 11/00*

U.S. Cl. 162—30.1 **5 Claims**

1. A method of converting spent alkaline pulping liquor to reusable pulping liquor containing sodium hydroxide, which method comprises pyrolyzing the pulping liquor by passing the pulping liquor through a zone of radiant energy having a wave length in the near-infrared region and a temperature of at least 3000° F. in the substantial absence of oxygen under conditions such that a solid product containing sodium carbide is produced, and quenching the solid product, before the solid product contacts oxygen gas, in water in order to convert the sodium carbide directly to sodium hydroxide, whereby a reusable pulping liquor containing sodium hydroxide is produced.

4,637,859

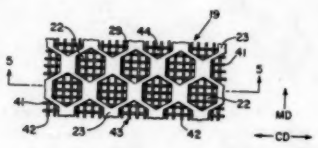
TISSUE PAPER

Paul D. Trokhan, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 525,586, Aug. 23, 1983, Pat. No. 4,529,480. This application Mar. 27, 1985, Ser. No. 716,724

Int. Cl.⁴ D21H *5/02*

U.S. Cl. 162—109 **7 Claims**



1. A strong, soft, absorbent paper web of papermaking fibers, said web comprising:

(A) A macroscopically monoplanar, patterned, continuous network region having a relatively low basis weight and a relatively high density; and

(B) A plurality of discrete domes having relatively high basis weights and relatively low densities, essentially all of said domes being dispersed throughout, encompassed by, and isolated one from another by said network region

wherein the average density of said network region is from about 0.400 to about 0.800 gram per cubic centimeter, the average density of said domes is from about 0.040 to about 0.150 gram per cubic centimeter, and the ratio of the average basis weight of said network region to the average basis weight of said domes is less than about 1.0 and greater than about 0.8.

4,637,860

BOARDS AND PANELS

Stephen Harper, London, and David G. Hiscock, Slough, both of England, assignors to Cape Building Products Limited, Uxbridge, England

Continuation of Ser. No. 389,389, Jun. 17, 1981, abandoned. This application Aug. 27, 1984, Ser. No. 644,160

Claims priority, application United Kingdom, Jun. 19, 1981, 8118947

Int. Cl.⁴ D21F *13/00*

U.S. Cl. 162—117 **17 Claims**

1. A process for the manufacture of a non-asbestos corrugated sheet for external use from a mixture comprising, on a dry weight basis, 40–60% cement, 30–40% silica and 5–15% cellulose fibers, comprising the following steps:

(1) processing the cellulose fibers to a freeness of 18°–35° S.R.;

(2) mixing the cellulose fibers with the cement and silica in a flocculating agent to produce an aqueous slurry;

(3) taking up the slurry on the moving permeable belt of a Hatschek machine to form a film of damp composition thereon and transferring said film to a rotating drum on which the mixture builds up;

(4) removing a desired thickness of mixture from the drum in the form of a flat sheet;

(5) forming said flat sheet into a corrugated shape;

(6) placing said corrugated sheet in the press and reducing its thickness therein; and

(7) subjecting the pressed corrugated sheet to an autoclaving reaction to cause reaction to occur between said cement and said silica to form a binder matrix.

4,637,861

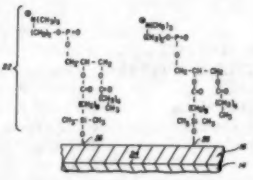
STABILIZED, LIPID MEMBRANE-BASED DEVICE AND METHOD OF ANALYSIS

Ulrich J. Krull, Weston, and Michael Thompson, Mississauga, both of Canada, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 16, 1985, Ser. No. 809,691

Int. Cl.⁴ G01N *27/30, 27/40*

U.S. Cl. 204—1 T **15 Claims**



1. A stabilized, lipid membrane-based device comprising a perturbable lipid membrane and a membrane-stabilizing support, said lipid membrane including a complexing agent for

selectively interacting with a specified chemical species to perturb said lipid membrane;

wherein each membrane-forming lipid includes a polar head group, a first long chain through which the lipid is anchored to a binding site on said support, and a fluidity-providing, second long chain, which is unattached to said support; and

wherein the binding sites on said support are spaced appropriately apart from one another to provide a lipid molecular packing density that permits axial rotation of each membrane-forming lipid about its anchored, long chain, and are yet sufficiently close to one another so that said lipid molecular packing density provides a relatively high ion impermeability to said lipid membrane when unperturbed;

said lipid membrane having an increased ion permeability when perturbed.

12. A process for determining the concentration of a selected chemical species in an aqueous electrolytic solution, said process comprising

(a) form electrochemical cell from the device of claim 1 and said aqueous electrolytic solution;

(b) applying across said lipid membrane an electrical potential difference that serves to drive ions through, or into and out of, said membrane, whereby said chemical species interacts with said complexing agent incorporated in said lipid membrane, to produce an analytical signal based upon an increase in membrane ion permeability;

(c) measuring said analytical signal; and

(d) determining said chemical species concentration from the measured analytical signal.

4,637,862

WIRE-GLASS COMPOSITE AND METHOD OF MAKING SAME

Gary L. Eesley, Lake Orion; Andrew M. Mance, Royal Oak, and Martin S. Meyer, Dearborn, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 16, 1985, Ser. No. 809,436

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 **9 Claims**

1. Method for forming an abrasion resistant, metallic pattern beneath the surface of a glass substrate comprising the steps of:

scoring a narrow groove in said surface, said groove delineating said pattern;

depositing an electrically continuous conductive strip of metal along the length of said groove;

immersing said substrate in an electroplating bath comprising a plethora of glass particles suspended in a solution of metal ions electrolytically reducible to form the metal of said pattern;

passing electrolyzing current through said metal strip and said bath to selectively electrolytically codeposit said pattern metal and said particles in said groove; and

firing said substrate to a temperature and for a time sufficient to fuse said particles one to the other and to said substrate;

whereby a precisely defined, abrasion resistant, electrically conductive pattern is formed beneath the surface of the substrate.

4,637,863

PROCESS FOR THE ELECTROSYNTHESIS OF ALCOHOLS AND OF EPOXY COMPOUNDS

Jacques Perichon, Savigny Sur Orge; Amélie Rabemanantsoa, Malakoff; Soline Sibille, La Varenne Saint Hilaire, and Esther D'Incan, Chatenay Malabry, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Mar. 28, 1986, Ser. No. 845,559

Claims priority, application France, Mar. 29, 1985, 85 04743

Int. Cl.[4] C25B *3/00*

U.S. Cl. 204—59 R **33 Claims**

1. Process for the electrosynthesis of alcohols by electrochemical reduction of organic halides in the presence of carbonyl derivatives in an electrolysis cell fitted with electrodes in an organic solvent medium containing a supporting electrolyte, comprising using a sacrifical anode made of a metal chosen from the group of the reducing metals and wherein said organic halides contain at least one atom or one functional group which stabilizes carbanions.

4,637,864

ELECTROCHEMICAL SYNTHESIS OF TERNARY PHOSPHIDES

Josephine Covino, and George E. McManis, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 28, 1986, Ser. No. 846,788

Int. Cl.[4] C25B *1/00*

U.S. Cl. 204—61 **6 Claims**

1. A method for the electrochemical synthesis of ternary phosphides of the general formula $M(II)M(IV)P_2$ by fused salt electrolysis comprising:

forming a melt powder mixture of compounds containing phosphorus;

placing said melt powder mixture in an electrolytic apparatus having a liquid metal cathode containing a silicon source and Zn metal source;

heating said electrolytic apparatus containing said melt powder mixture and liquid metal cathode to a temperature of 1000° C. or greater to form a molten mixture;

electrolyzing said molten mixture at a potential of about 4.0 to 5.0 volts to form a fused reaction melt in which oxygen is excluded as an impurity; and

cooling the mixture and recovering the resulting ceramic compound from said melt by leaching with an acid wash.

4,637,865

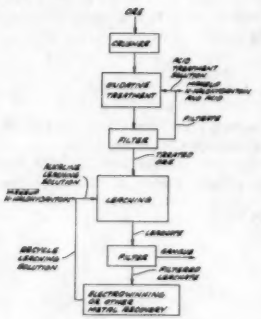
PROCESS FOR METAL RECOVERY AND COMPOSITIONS USEFUL THEREIN

Rodney H. Sergent, West Lafayette, Ind., and Kenneth N. Thanstrom, Sylmar, Calif., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Aug. 16, 1985, Ser. No. 766,833

Int. Cl.[4] C25C *1/20*

U.S. Cl. 204—111 **50 Claims**



1. A process for extracting a precious metal or base metal from a source material containing said metal, the process comprising contacting said source material with an aqueous leaching solution containing a leaching agent comprising an N-halohydantoin compound, thereby producing an aqueous leachate containing said metal.

4,637,866

RECOVERY METHOD OF TRITIUM FROM TRITIATED WATER

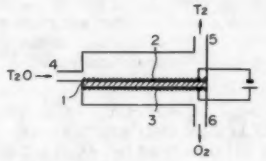
Satoshi Konishi, Tokaimura; Hideo Ohno, Mito; Yuji Naruse, Tokaimura, and Hiroshi Yoshida, Mito, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 587,010, Mar. 7, 1984, abandoned. This application Oct. 4, 1985, Ser. No. 785,091

Claims priority, application Japan, Mar. 18, 1983, 58-044394

Int. Cl.⁴ C25B *1/02*

U.S. Cl. 204—129 **1 Claim**



1. A process for recovering tritium gas from tritiated water, comprising the steps of:

disposing an oxygen ion-conductive solid electrolytic membrane, having a cathode and an anode disposed upon opposite sides thereof, within an electrolytic cell;

applying electricity to said cathode and anode electrodes of said electrolytic membrane;

conducting a gas stream, containing tritiated water steam, into said electrolytic cell such that said gas stream only contacts said cathode electrode of said electrolytic membrane;

recovering tritium gas only from said cathode side of said electrolytic cell; and

recovering oxygen gas only from said anode side of said electrolytic cell.

4,637,867

PROCESS FOR PRODUCING HYDROGEN FROM SHORT WAVELENGTH ELECTROMAGNETIC RADIATION

Ralph L. Herbst, Jr., 926 Langdon Ave., Box No. 6, Horsham, Pa. 19044

Filed Oct. 14, 1981, Ser. No. 311,288

Int. Cl.⁴ B01J *19/08*

U.S. Cl. 204—157.52 **26 Claims**

1. A process for producing hydrogen comprising applying gammarays or X-rays to an aqueous composition comprising (1) at least one photoexcitable reagent which strongly absorbs said radiation energy at ground level causing it to enter its oxidized state and donate an electron whereby the reagent is oxidized, and at least one reagent (2) being at least one non-sacrificial chain reaction agent which forms a free radical in said aqueous composition and which reduces the oxidized photoexcited reagent when said composition is exposed to said radiation; and at least one reagent (3) being at least one spectral sensitizer whereby hydrogen is produced.

4,637,868

METHOD OF OXIDIZING HYDRAZO COMPOUNDS TO CORRESPONDING AZO COMPOUNDS BY HYDROGEN PEROXIDE

Julien Moroux, Lamorlaye, France, assignor to Societe Francaise d'Organo-Synthese, Gennevilliers, France

Filed Mar. 4, 1986, Ser. No. 835,910

Claims priority, application France, Mar. 4, 1985, 85 03147

Int. Cl.⁴ C07C *107/02*

U.S. Cl. 204—157.82 **4 Claims**

1. A method of oxidizing hydrazo compounds to corresponding azo compounds, and more particularly 4,4'-hydrazo-bis-4-cyano-pentanoic acid to 4,4'-azobis-4-cyano-pentanoic acid at a temperature close to ambient temperature,

said method comprising the step of effecting oxidation with the aid of hydrogen peroxide, under the following conditions:

catalysis of the reaction by means of UV radiation,

operation in aqueous solution at a pH≦0.5, said pH being obtained by addition of hydrochloric acid and/or hydrobromic acid,

operation in a reaction medium comprising Br^- ions at a concentration at least equal to 30 ppm.

4,637,869

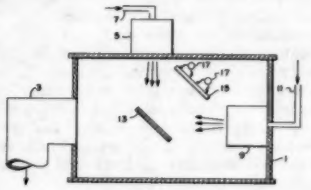
DUAL ION BEAM DEPOSITION OF AMORPHOUS SEMICONDUCTOR FILMS

David A. Glocker, West Henrietta, N.Y.; John R. Miller, Shaker Heights, Ohio; Scott F. Grimshaw, Jordan, N.Y., and Henry Windischmann, Solon, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 647,208, Sep. 4, 1984, abandoned, and a continuation-in-part of Ser. No. 653,168, Sep. 24, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 814,837

Int. Cl.⁴ C23C *14/14, 14/16, 14/18, 14/46*

U.S. Cl. 204—192.11 **18 Claims**



1. A process for depositing a hydrogenated amorphous semiconductor film on a substrate comprising:

simultaneously directing first and second ion beams, produced by first and second ion sources, respectively, against a first target of a semiconductor material that is to be included in said film, said first ion beam including sputtering ions to sputter material from said first target and said second beam including hydrogen ions to reduce the density of localized states in the deposited film;

independently controlling the relative energies and currents of ions in said first and second beams so that the sputtering ions are effective in sputtering semiconductor material from said target and so that the energy of said hydrogen ions in the second ion beam does not exceed about 200 electron volts; and

collecting sputtering products from said first target on said substrate, whereby a film of hydrogenated amorphous semiconductor material substantially free of polyhydrides is efficiently deposited.

4,637,870

HYDROCRACKING WITH PHOSPHOMOLYBDIC ACID AND PHOSPHORIC ACID

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 728,280, Apr. 29, 1985. This application Oct. 10, 1985, Ser. No. 785,986

Int. Cl.⁴ C10G *47/04*

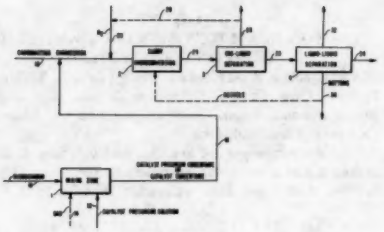
U.S. Cl. 208—112 **12 Claims**

1. A process for hydroconverting a heavy hydrocarbonaceous oil chargestock comprising a catalyst to produce lower boiling hydrocarbon products, which comprises reacting said chargestock with hydrogen at hydroconversion conditions, including a temperature ranging from about 800 to about 900°

F., said catalyst having been prepared by the steps which comprise:

(a) adding phosphoric acid to an aqueous solution of phosphomolybdic acid in an amount to provide in said solution an atomic ratio of phosphorus to molybdenum ranging from 0.12:1 to 0.45:1; and, subsequently

(b) forming a mixture of a hydrocarbonaceous material having a different boiling point range from said chargestock and the aqueous solution resulting from step (a), in an amount to provide in said mixture from about 0.2 to 2 weight percent molybdenum, calculated as elemental



metal, based on said hydrocarbonaceous material to produce a catalyst precursor concentrate;

(c) introducing at least a portion of said catalyst precursor concentrate into said chargestock; and

(d) heating the mixture resulting from step (b), or the mixture resulting from step (c) in the presence of a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and mixtures thereof at conditions to convert said phosphomolybdic acid and said phosphoric acid to a solid molybdenum and phosphorus-containing catalyst.

4,637,871

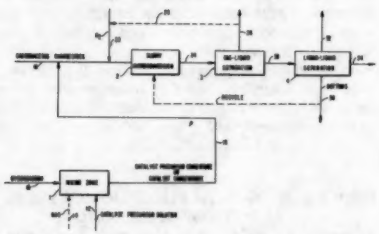
HYDROCRACKING WITH AQUEOUS PHOSPHOMOLYBDIC ACID

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 728,281, Apr. 29, 1985. This application Oct. 10, 1985, Ser. No. 785,994

Int. Cl.[4] C10G *47/02*

U.S. Cl. 208—112 **10 Claims**



1. In a method for preparing a catalyst wherein aqueous phosphomolybdic acid is heated in the presence of a hydrocarbonaceous material and a gas selected from the group consisting of a hydrogen-containing gas, a hydrogen sulfide-containing gas and mixtures thereof to convert said phosphomolybdic acid to a solid catalyst, the improvement which comprises:

(a) forming a mixture of a first hydrocarbonaceous material comprising at least about 10 weight percent constituents boiling above about 1050° F. and said aqueous solution of phosphomolybdic acid in an amount to provide in said mixture from about 0.2 to 2 weight percent molybdenum, calculated as elemental metal, based on said first hydrocarbonaceous material, said aqueous solution comprising from about 3 to about 5 weight percent molybdenum derived from said phosphomolybdic acid to produce a catalyst precursor concentrate;

(b) introducing at least a portion of said catalyst precursor concentrate into a second hydrocarbonaceous material having a different boiling point range from said first hydrocarbonaceous material;

(c) heating the mixture resulting from step (a) or the mixture resulting from step (b) in the presence of a gas selected from the group consisting of hydrogen-containing gas, hydrogen sulfide-containing gas, and mixtures thereof at conditions to convert said phosphomolybdic acid to a solid molybdenum-containing catalyst.

4,637,872

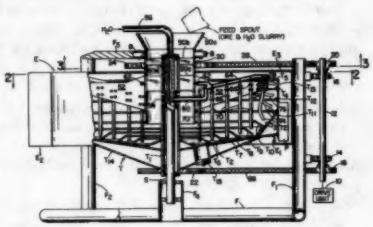
GRAVEL WASHER SEPARATOR

Carl E. Balkus, 147 Deep Wood Dr., Amston, Conn. 06231

Filed Apr. 12, 1985, Ser. No. 722,816

Int. Cl.[4] B03B *5/58*; B04B *1/06*

U.S. Cl. 209—453 **18 Claims**



1. A separator for extracting gold from a slurry of ore, gravel and water, and comprising in combination:

(a) a fixed frame including tub support spindle means,

(b) an upwardly open tub rotably mounted to said tub support spindle means having a plurality of spaced annular dams projecting from the interior walls of said tub, said annular dams defining annular spaces therebetween,

(c) means for receiving a slurry of gold ore gravel and water into said tub, said slurry receiving means being rotatably mounted to said spindle means,

(d) rake means fixedly mounted to said slurry receiving means, said rake means having radially spaced portions provided between the annular dams,

(e) means for rotating said tub and said slurry receiving means in the same direction but at slightly different rotational speeds on a vertical axis defined by said spindle means, and

(f) outlet means for the water and gravel spilling from said upwardly open tub.

4,637,873

FRONT LOAD SKIMMER/FILTER FOR SPAS AND POOLS

Daniel A. DeSousa, Clayton; Gary L. Gockel, Martinez; Ralph D'Inaocente, Walnut Creek, and Roy A. Jacuzzi, Moraga, all of Calif., assignors to Jacuzzi Inc., Little Rock, Ark.

Filed Dec. 16, 1985, Ser. No. 815,501

Int. Cl.[4] E04H *3/20*; C02F *1/00*

U.S. Cl. 210—169 **13 Claims**

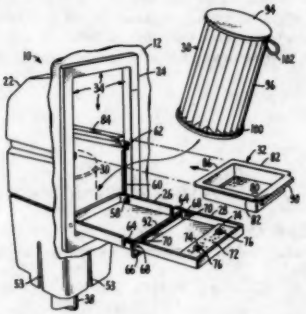
1. An apparatus for filtering water drawn from the surface of a water-filled spa, said apparatus comprising:

a housing affixed to a side wall of the spa, said housing including an opening proximate the water surface through

which water enters said housing from the spa, and including a drain through which the water exits said housing;

a filter disposed within said housing and operable for filtering water flowing through said housing, wherein said filter is removable from said housing through said opening;

an access door releasably coupled to said housing and moveable between a closed position that covers an underwater portion of said opening during filtering operation of said



apparatus and an open position that uncovers said opening to provide access for the installation and removal of said filter; and

a weir located above said access door and operatively associated with said opening and moveable between a position wherein said weir regulates the flow of water entering said housing and a position that uncovers said opening to provide access for the installation and removal of said filter.

4,637,874

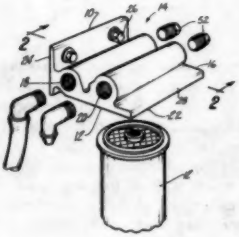
FILTER HEAD FOR SPIN-OFF FILTERS

John J. Ansteth, 2233 Star Ct., Auburn Heights, Mich. 48057

Filed Aug. 12, 1985, Ser. No. 764,475

Int. Cl.[4] B01D *35/00*

U.S. Cl. 210—232 **14 Claims**



1. A filter head comprising: at least one spin-off filter having a diameter and having a fluid inlet structurally separated from a fluid outlet, said filter head comprising including,:

an extruded body having a first body portion defining a first longitudinal bore, a second body portion defining a second longitudinal bore separated from said first longitudinal bore, and a flat longitudinal surface; and

means for mounting at least one spin-off filter against said flat surface so that said fluid inlet is in fluid communication with said first longitudinal bore and said fluid outlet is in communication with said second longitudinal bore;

wherein the length of said body is about equal to an integral multiple of the diameter of said filter, said multiple corresponding to the number of said at least one filter.

12. A process comprising: forming a filter head for at least one spin-off filter having a diameter and having a fluid inlet structurally separated from a fluid outlet at an end of said filter, by the steps of

extruding a material to form an elongated body having first and second longitudinal bores spaced apart from each other, and a flat exterior surface; and

cross sectionally cutting said elongated body to form a segment having a length at least as long as any integral multiple of the diameter of said at least one filter.

4,637,875

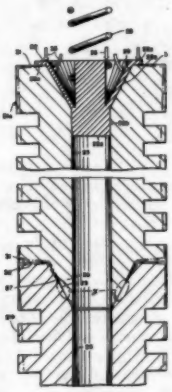
FLUID FILTERING APPARATUS AND TUBULAR FILTER THEREFOR

Loren H. Semler, Jr., Mt. Prospect, Ill., assignor to Semler Industries Inc., Franklin Park, Ill.

Continuation of Ser. No. 171,166, Jul. 22, 1980, abandoned, which is a continuation of Ser. No. 16,336, Feb. 28, 1979, abandoned. This application Jul. 19, 1982, Ser. No. 399,273

Int. Cl.[4] B01D *25/00*

U.S. Cl. 210—232 **19 Claims**



1. A filter element comprising an elongated body formed of porous fluid-filtering material capable of limited deformation under conditions of use and provided with a flow passage extending longitudinally therethrough; said body having an upper end portion, lower end portion, and an intermediate portion, wherein the improvement comprises said body having a frusto-conical recess in one of its end portions and a frusto-conical protrusion provided by the other of said end portions, said protrusion and said recess being coaxial and the surfaces thereof defining said frusto-conical protrusion and recess, respectively, being of substantially the same slope and being formed of said porous filtering material, said protrusion and recess each being dimensioned to mate with a respective recess or protrusion of another identical filter element coaxial therewith, siad frusto-conical protrusion having a maximum diameter greater than the maximum diameter of said recess.

4,637,876

DISC SHAPED FILTER ELEMENT

Martin Dosoudil, Kwakelkade 28, Alkmaar, Netherlands

Filed Feb. 11, 1985, Ser. No. 700,367

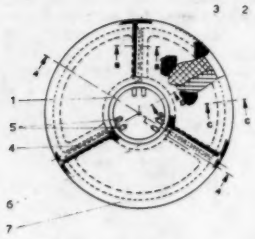
Claims priority, application Netherlands, Mar. 1, 1984, 8400662

Int. Cl.[4] B01D *33/28*

U.S. Cl. 210—331 **10 Claims**

1. A disc-shaped filter element comprising a pair of generally planar disc-shaped filter members disposed in spaced generally

parallel relation to one another, annular sealing means located between and attached to the outer peripheries of said disc-shaped filter members, a hollow boss-member through which filtrate is to be discharged, said boss member being coaxial with said annular seal member and being attached to each of said filter members adjacent the center of said disc-shaped filter element, a plurality of radial sealing members attached to each of said filter members and extending from said hollow boss member to said annular sealing member between said filter members for subdividing the interior of said filter element into a plurality of separate sectors, and a plurality of conduits which extend from said sectors respectively through said boss member to effect fluid-flow communication between each of said sectors and the interior of said hollow boss member, each of said radial sealing members comprising an elongated web of flexible material which extends across the space between said



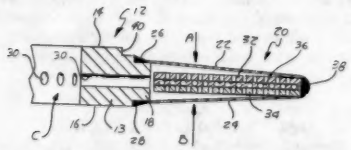
pair of filter members, said elongated web being provided with lips of said flexible material that extend outwardly of said web in opposite directions relative to the direction of elongation of said web and generally parallel to the planes of said filter members, said lips being attached to each of said filter members with the flexible material of said lips penetrating those portions of said filter members which are adjacent to said lips, a first pair of said lips extending outwardly of said web in said opposite directions adjacent one of said disc-shaped filter members, and a second pair of said lips extending outwardly of said web in said opposite directions adjacent the other of said disc-shaped filter members, one of the lips in each of said first and second pairs of lips being attached to its respective adjacent filter member, and the other lip in each of said first and second pairs of lips lying loosely against the surface of its respective adjacent filter member.

4,637,877

FILTER DISC

Wilhelm U. Hartmann, Sepulveda, and James A. Martin, Sylmar, both of Calif., assignors to HR Textron Inc., Valencia, Calif.

Filed Sep. 3, 1985, Ser. No. 771,925
Int. Cl.[4] B01D *33/00*
U.S. Cl. 210—347 **4 Claims**



1. disc-shaped stainless steel filter element for filtering fluid flowing from outside to inside thereof and including filter media of randomly disposed stainless steel sintered fibers comprising:

a solid stainless steel hub including a body defining a central opening therethrough and having first and second spaced apart surfaces,

a radially extending peripheral flange,

a plurality of radial passageways extending through said body including said flange;

first and second layers of sintered stainless steel ramdomly disposed fiber filter media disposed over said flange and extending radially outwardly from the periphery of said first and second spaced apart surfaces respectively; and

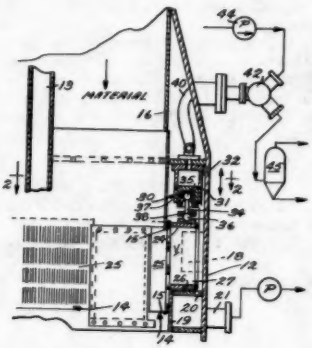
a stainless steel spacer means disposed between said media layers, said layers and said spacer means being continuously fusion welded together about the outer periphery thereof, said layers of said media being continuously fusion welded to said flange at said first and second surfaces.

4,637,878

RECIPROCAL MOVABLE SCREENS IN A VERTICALLY ELONGATED VESSEL

Johan C. F. C. Richter, Oslo, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Filed Mar. 9, 1982, Ser. No. 356,464
Int. Cl.[4] B01D *33/00*
U.S. Cl. 210—388 **20 Claims**



1. In a pressurized vessel for vertically passing fibrous material suspended in liquid, the vessel having a vertical wall curved about a vertical axis, a structure comprising:

a vertically elongated screening member, curved about a vertical axis;

means for mounting said screening member inside and adjacent the vertical wall of the vessel, for up and down reciprocal movement, defining a screening volume between the screening member and the vertical wall; and for substantially sealing the screening volume from the interior of the vessel, except through the screening member and clearance gaps between the screening member and the vessel wall, during reciprocation of the screening member; and

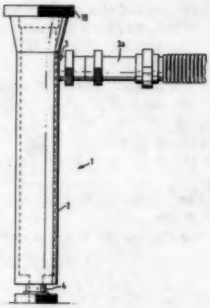
means for reciprocating said screening member vertically up and down with respect to the vertical wall, said reciprocating means comprising: a piston and cylinder assembly mounted within said screening volume; means for operatively attaching said piston to said screening member; a fluid conduit operatively connected to one side of said piston and to a two-way valve, the vessel pressure acting on the other side of said piston; and means for selectively operatively connecting said valve to a source of fluid under pressure or a vent.

4,637,879

APPARATUS FOR USE IN FILTERING A LIQUID

Philip J. Hartley, 24 Ardoyne House, Pembroke Park, Ballsbridge, Dublin 4, Ireland

Filed Jul. 16, 1985, Ser. No. 755,664
Claims priority, application Ireland, Nov. 15, 1984, 2940/84
Int. Cl.[4] B01D 27/00
U.S. Cl. 210—448 7 Claims



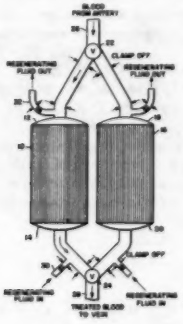
1. An apparatus for use in filtering a liquid which apparatus comprises a casing for receiving the liquid; a removable filtering device housed in the casing, the device comprising a pair of collar members; at least one rod member connecting the collar members; a coil shaped frame linking the collar members; a disposable filter element on the frame; the casing having an inlet port for connection to a source of liquid to be filtered and an outlet port for filtered liquid; a seal member for providing, in use, a fluid tight engagement of the filtering device in the casing; the outlet port having an internal groove in which rests the seal member, the seal member being in the form of a plug having a through bore therein which provides a passage for the liquid being discharged from the casing via the outlet port, the plug having means for tight fit engagement with the collar member at the outlet port.

4,637,880

APPARATUS AND METHOD FOR THERAPEUTIC IMMUNODEPLETION

Seymour P. Halbert, Miami, Fla., assignor to Cordis Laboratories, Inc., Miami, Fla.

Continuation of Ser. No. 326,134, Nov. 30, 1981, abandoned.
This application Jun. 1, 1984, Ser. No. 616,789
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—638 7 Claims



1. Therapeutic extracorporeal shunt apparatus connectable to an artery and vein of a patient for removal of an agent from the patient's blood, said apparatus including provision for simultaneous treatment and on-line regeneration, comprising:

(a) pick-up means for directing blood from an artery of the patient to the therapeutic extracorporeal shunt apparatus;

(b) return means for directing blood to a vein of the patient from the therapeutic extracorporeal shunt apparatus;

(c) a first blood flow path connecting said pick-up means and said return means and having closable ports for in-flow and out-flow of a regenerating fluid, comprising

(i) a bundle of at least two hundred parallel hollow fibers having covalently bound to their inner surfaces an immunoadsorbent capable of binding said agent, thereby removing it from the patient's blood, and

(ii) a header at each end of said bundle in fluid communication with the interior of the fibers in said bundle to provide a flow passage through the length of the interiors of said hollow fibers;

(d) a second blood flow path, isolatable from said first blood flow path, connecting said pick-up means and said return means and having closable ports for in-flow and out-flow of a regenerating fluid, comprising

(i) a bundle of at least two hundred parallel hollow fibers having covalently bound to their inner surfaces an immunoadsorbent capable of binding said agent, thereby removing it from the patient's blood, and

(ii) a header at each end of said bundle in fluid communication with the interior of the fibers in said bundle to provide a flow passage through the length of the interiors of said hollow fibers;

(e) first valve means for selectively flowing blood through said first blood flow path or said second blood flow path; and

(f) second valve means for selectively flowing regenerating fluid through either said first blood flow path or said second blood flow path while blood is flowing through the other blood flow path,

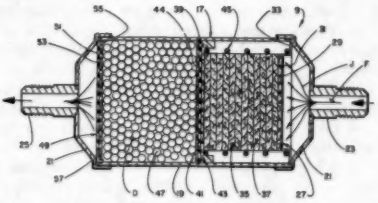
wherein said parallel hollow fibers are of a number and size selected to provide for an extracorporeal blood volume and flow rate sufficient, under the impetus of arterial pressure, to provide adequate flow through and contact with the hollow fibers of said first blood flow path for efficacious, continuous treatment of said patient.

4,637,881

FILTER DRIER

George J. Sciuto, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 480,225, Mar. 30, 1983, abandoned.
This application Dec. 3, 1984, Ser. No. 677,934
Int. Cl.[4] B01D 27/02; F25B 43/00
U.S. Cl. 210—689 4 Claims



1. A method of filtering liquid refrigerant in a refrigeration system, said system comprising a compressor for receiving refrigerant vapor and for compressing it to an elevated pressure, a condensor for rejecting heat from said compressed vapor, an evaporator for absorbing heat from its surroundings, and a thermostatic expansion valve between said condensor and said evaporator for expanding said refrigerant, said method comprising the steps of:

between said condensor and said evaporator, first directing a jet of said refrigerant into a filter drier, said filter drier having a housing having an inlet and an outlet;

then, diffusing said jet as it enters said filter drier;

then, passing said diffused jet of refrigerant through a primary filtering means, said primary filtering means comprising a plurality filter pads stacked in face-to-face relation;

then, passing said refrigerant through an intermediate perforate support plate;

then, passing said refrigerant through an upstream fibrous filtering pad, said upstream pad being of a fibrous filtering media extending transversely across the full cross section of said filter drier housing, said intermediate plate and said upstream pad being axially shiftable within said filter drier;

then, passing said refrigerant through a bed of desiccant media comprising a multiplicity of desiccant beads;

passing said refrigerant through a downstream fibrous filtering pad;

then, passing said refrigerant through a downstream perforate support plate for discharge from filter drier housing via said outlet; and

resiliently compacting said desiccant bed between said upstream and downstream filtering pads thereby to maintain said desiccant beads in a compacted state even when the flow of said jet of refrigerant is alternately started and terminated so as to substantially prevent movement of said beads relative to one another upon the start-up and shut down of said compressor.

3. A filter drier for installation in a liquid line of a refrigeration system, said filter drier comprising a housing having a shell and a shell end at each end of said shell, an inlet, an outlet, and a flow path for the flow of liquid refrigerant through said housing from said inlet to said outlet, a bed of desiccant media including a multiplicity of desiccant beads within said housing adjacent said outlet, downstream filter means between said desiccant bed and said outlet, downstream perforate support means, the latter being fixed relative to said downstream shell end against axial movement toward said outlet for holding said desiccant bed and said downstream filter means in position within said housing and for permitting the flow of liquid refrigerant from said downstream filter means to said outlet, intermediate perforate support means within said housing on the upstream side of said desiccant bed, said intermediate perforate support means being movable axially within said housing and being positioned upstream from said desiccant bed, upstream filter means disposed between said desiccant bed and said intermediate perforate support means, primary filter means between said intermediate perforate support means and said inlet, said primary filter means having a primary filter body, upstream perforate support means between said primary filter means and said inlet for diffusing a jet of liquid refrigerant discharged from said inlet substantially across the width of said shell at the upstream end thereof so that said diffused stream of refrigerant flows through said primary filter means, said upstream perforate support means being fixed relative to said upstream shell end against axial movement toward and away from said inlet, said downstream and upstream filter means each comprising one or more suitable pads of fibrous filtering media extending transversely across substantially the full cross section of said housing, and a compression spring interposed between said upstream perforate support plate and said intermediate perforate support means for applying a resilient, compacting force on said desiccant bed between said upstream filter pad and said downstream filter pad thereby to maintain said desiccant bed in a compacted state even when the flow of said refrigerant is alternately started and stopped so as to substantially prevent movement of said beads relative to one another, said spring being free of said primary filter body such that said primary filter body is substantially free of axial compaction by said spring.

4,637,882

POLYAMPHOLYTES - HIGH TEMPERATURE VISCOSIFIERS FOR HIGH IONIC STRENGTH DRILLING FLUIDS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J., and Kenneth W. Pober, Houston, Tex., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 16, 1983, Ser. No. 562,163
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.[4] C09K 7/00
U.S. Cl. 252—8.514 8 Claims

1. A hydrolytically stable, high temperature water-based drilling mud which comprises:

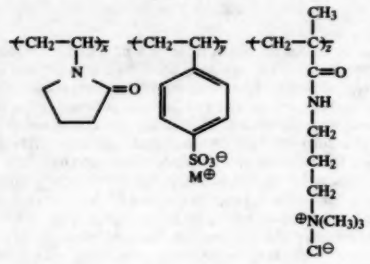
(a) water;

(b) about 4 to about 30 lbs/bbl of clay;

(c) about 1 to about 30 lbs/bbl of a lignosulfonate, if necessary;

(d) weighting material of sufficient quantity necessary to achieve the desired density;

(e) about 0.25 to about 5 lbs/bbl of a terpolymer having the formula:



wherein x is about 40 to about 98 mole %, y is about 1 to about 50 mole %, z is about 1 to about 50 mole %, wherein y and z are less than 60 mole %, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and II of the Periodic Table of Elements; and

(f) base of sufficient quantity to adjust the pH of the water-based drilling mud to about 10 to about 10.5.

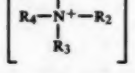
4,637,883

FLUID LOSS ADDITIVES FOR OIL BASE MUDS AND LOW FLUID LOSS COMPOSITIONS THEREOF

Arvind D. Patel, Houston, and Carmelita S. Salandanan, Sugarland, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 661,639, Oct. 17, 1984. This application Apr. 7, 1986, Ser. No. 848,559
Int. Cl.[4] C09K 7/06
U.S. Cl. 252—8.515 10 Claims

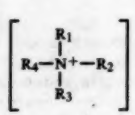
1. An oil base drilling mud formulation comprising a petroleum oil, an emulsifier, a water soluble salt, a gelling agent, a weighting agent and a quebracho ammonium salt reaction product of quebracho with an alkyl quaternary ammonium salt having the formula



wherein R_1, R_2, R_3 and R_4 are alkyl groups, at least one of

which contains from 1 to 6 carbon atoms and at least one of which contains 10 to 22 carbon atoms, or aralkyl groups wherein the alkyl contains 1 to 3 carbon atoms; X is a halogen, sulfate or hydroxyl anion, said quebracho ammonium salt reaction product being present in an amount sufficient to reduce the fluid loss of said oil base drilling mud by filtration.

6. In a process wherein a petroleum oil base drilling mud is introduced into a well wherein said mud is subject to fluid loss by filtration, the step comprising adding to the oil base drilling mud quebracho ammonium salt reaction product of quebracho with an alkyl quaternary ammonium salt having the formula



wherein R_1, R_2, R_3 and R_4 are alkyl groups, at least one of which contains from 1 to 6 carbon atoms and at least one of which contains 10 to 22 carbon atoms, or an aralkyl group wherein the alkyl contains 1 to 3 carbon atoms; X is a halogen, sulfate or hydroxyl anion, in an amount to reduce the fluid loss of said oil base drilling mud by filtration.

4,637,884

SLIDING MEMBER OF GRAPHITE-BORON CARBIDES

Kenji Miyazaki, Dazaifu; Tsuyoshi Hagio; Ichitaro Ogawa, both of Tosu; Hisayoshi Yoshida, Ogori; Kazuo Kobayashi; Kazutsugu Kashima, both of Tosu; Takashi Tada; Yoichiro Hayashi, both of Fujisawa, and Wataru Abe, Hiratsuka, all of Japan, assignors to Agency of Industrial Science and Technology and Oiles Industry Co., LTD, both of Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 756,086

Claims priority, application Japan, Jul. 20, 1984, 59-149706

Int. Cl.[4] F16C *33/16*

U.S. Cl. 252—12 **4 Claims**

1. A high temperature-resistant and abrasion-resistant sliding member of graphite-boron carbides, showing the friction coefficient of 0.01 to 0.13 and the specific abrasion amount of 10^{-7} to 10^{-9} mm^2/kg under the measuring conditions of the load of 20 kg/cm^2 and the sliding velocity of 5 m/min at a temperature of 300° C., the bending strength of 300 to 1600 $kg.f/cm^2$ and Shore hardness of 45 to 60, produced by the process comprising the steps of mixing and stirring from 65 to 95% by weight of powdery carbon of an average particle size of 10 to 150 μm and from 5 to 35% by weight of powdery boron carbide of an average particle size of 0.5 to 2.5 μm until said powdery boron carbide is uniformly dispersed in said powdery carbon, and sintering the thus prepared uniform mixture at a temperature of 2020° C. or more and less than the transition point at which the structure of carbon and boron carbide in said uniform mixture is remarkably changed, under a pressure of from 100 to 250 kg/cm^2.

4,637,885

METAL-WORKING OIL COMPOSITION

Hiroshi Kuwamoto, Fukuyama; Hiroyuki Nagamori; Takashi Mukai, both of Wakayama, and Shuichi Iwado, Fukuyama, all of Japan, assignors to Kao Corporation and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 615,945, May 31, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,359

Claims priority, application Japan, Jun. 10, 1983, 58-103627

Int. Cl.[4] C10M *137/04, 137/08, 137/16*

U.S. Cl. 252—32.5 **17 Claims**

1. A metal-working oil composition consisting essentially of:

(a) 99–50 wt.% of one or more lube-oil components selected from the group consisting of oils, fats, mineral oils and fatty acid esters;

(b) 0.1–20 wt.% of one or more compounds selelcted from the group consisting of salts of:

aliphatic, alicyclic and aromatic amines having 4 to 22 carbon atoms and quaternary ammonium salts formed from aliphatic or aromatic amines having 4 to 22 carbon atoms; and

acidic phosphoric acids selected from the group consisting of:

(i) phosphorous acid, thio compounds thereof, ester compounds thereof and thio compounds of phosphoric acid;

(ii) mono- and di-phosphoric acid esters containing an aryl group and at least one hydroxyl group, thio compounds thereof, and thio compounds of mono- and di-phosphoric acid esters containing an alkyl or alkylaryl group and at least one hydroxyl group;

(iii) mono- or di-phosphonic acids containing a (C_1–C_8) alkyl group, an alkylaryl or aryl group, and thio compounds thereof;

(iv) mono- or di-phosphinic acids containing a (C_1–C_8) alkyl group, an alkylaryl or aryl group, and thio compounds thereof;

(v) mono-, di- or tri-phosphonic acids containing one or more nitrogen atoms;

(vi) phosphonous acids containing a (C_1–C_8) alkyl group, an alkylaryl or aryl group, and thio compounds thereof; and

(vii) phosphinous acids containing a (C_1–C_8) alkyl group; and

(c) 0.2–5.0 wt.% of a non-ionic surfactant.

4,637,886

MACROCYCLIC POLYAMINE AND POLYCYCLIC POLYAMINE MULTIFUNCTIONAL LUBRICATING OIL ADDITIVES

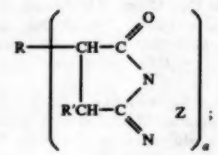
Stanley J. Brois, Westfield, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

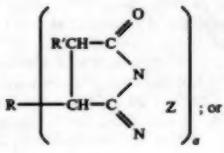
Continuation-in-part of Ser. No. 453,143, Dec. 27, 1982, abandoned, which is a continuation-in-part of Ser. No. 415,980, Sep. 8, 1982, abandoned, which is a division of Ser. No. 243,781, Mar. 16, 1981, abandoned, which is a continuation of Ser. No. 67,546, Aug. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 817,217, Jul. 20, 1977, Pat. No. 4,174,322, and a continuation-in-part of Ser. No. 806,326, Jun. 13, 1977, Pat. No. 4,167,514. This application Nov. 16, 1983, Ser. No. 550,977

Int. Cl.[4] C10M *149/02, 149/04*

U.S. Cl. 252—51.5 A **9 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and 0.01 to 20 wt% of a macrocyclic polyamine compound being a member of the group of compounds and mixtures thereof having the formulas:





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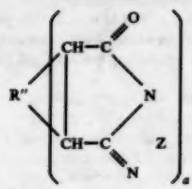


where R' is hydrogen or lower C_1–C_{12} alkyl, R is a hydrocarbon substituent having 2 to 15,000 carbon atoms, R'' is a hydrocarbon substituent of 4 to 15,000 carbon atoms, Z is $-CH_2CH_2CH_2-$ or $-(CH_2CH_2CH_2NH)_nCH_2CH_2CH_2-$ where n is 1–6; or $(CH_2CH_2CH_2NH_m)CH_2(CH_2)_p(NH-CH_2CH_2CH_2)_{m'}-$ where m and m' are each at least 1 and m+m' is 2–5, p is 1–4, and a is 1–20.

4,637,887

LUBRICANTS FOR VINYL CHLORIDE POLYMERS

Kurt Worschech, Loxstedt-Bexhoevede; Frido Loeffelholz, Bremerhaven-Surheide; Peter Wedl, Loxstedt-Bexhoevede, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 30, 1985, Ser. No. 739,249

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420226

Int. Cl.[4] C10M *129/66, 129/76*

U.S. Cl. 252—56 R 10 Claims

1. In the process of molding polyvinyl chloride or copolymers predominantly containing vinyl chloride wherein a molding lubricant is employed, the improvement comprising using a lubrication effective amount of a molding lubricant consisting essentially of triglycerides containing hydroxy fatty acid residues obtained by hydrogenating at least one epoxidized natural fat or oil selected from olive oil, linseed oil, sunflower oil, safflower oil, peanut oil, corn oil, palm oil, tall oil, lard oil, herring oil, whale oil, soybean oil, rapeseed oil, or tallow.

4,637,888

REVERSIBLE PHASE CHANGE COMPOSITION FOR STORING ENERGY

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 504,763, Jun. 15, 1983, abandoned. This application Jun. 11, 1985, Ser. No. 743,237

Int. Cl.[4] C09K *5/06*

U.S. Cl. 252—70 37 Claims

1. A reversible liquid/solid phase change composition having a melting temperature of from about 5° to about 50° C., said composition comprising a hydrated mixture of from about 20 to about 67 weight percent $CaBr_2$, from greater than zero to about 38 weight percent $CaCl_2$, from about 28 to about 50 weight percent water, and a modifier selected from the group consisting of KBr, and mixtures of KBr and KCl, said modifier being present in an amount greater than zero to less than about 10 weight percent and sufficient to modify the semicongruent melting behavior of the $CaBr_2/CaCl_2$ mixture to reduce, during freezing of the composition, the formation of crystalline $CaBr_2$ and $CaCl_2$ hydrate phases other than the hexahydrate phase.

4,637,889

ORGANOPOLYSILOXANE VISCOUS COUPLER FLUIDS

Kelichi Kishimoto, and Makoto Yoshitake, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,518

Claims priority, application Japan, Feb. 12, 1985, 60-25070

Int. Cl.[4] C10M *107/50;* C07F *7/08*

U.S. Cl. 252—75 9 Claims

1. An organopolysiloxane viscous coupler fluid comprising

(a) an organopolysiloxane fluid having the average unit formula

$$R_aSiO_{(4-a)/2}$$

in which R is a monovalent hydrocarbon radical and a has an average value of from 1.5 to 3.0

(b) a zirconium-containing organosiloxane compound having in each molecule at least one zirconium atom and at least one siloxane unit of the formula

$$R^1_bSiO_{(4-b)/2}$$

in which R^1 is a monovalent hydrocarbon radical and b is an integer of from 1 to 3 inclusive, where said zirconium-containing organosiloxane contains from 0.001 to 1.0 weight percent zirconium atom based on the weight of component (a), and

(c) a cerium-containing organosiloxane compound having in each molecule at least one cerium atom and at least one siloxane unit of the formula

$$R^2_cSiO_{(4-c)/2}$$

in which R^2 is a monovalent hydrocarbon radical and c is an integer of from 1 to 3, where said cerium-containing organosiloxane contains from 0.001 to 1.0 weight percent cerium atom based on the weight of component (a).

4,637,890

DETERGENT COMPOSITION PROVIDING RINSE CYCLE SUDS AND TURBIDITY CONTROL CONTAINING A SOAP, QUATERNARY AMMONIUM SALT AND A SILICONE

Paul J. Crabtree, Cincinnati, Ohio, and Kazuhiko Imakawa, Takarazuka, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 23, 1986, Ser. No. 821,670

Int. Cl.[4] B01D *19/04;* C11D *9/36, 10/04, 17/06*

U.S. Cl. 252—90 5 Claims

1. A granular detergent composition providing reduced sudsing and rinse water turbidity during rinsing following a washing operation, said composition comprising:

(a) at least one surfactant;

(b) at least one soluble detergency builder; and

(c) a plurality of rinse cycle suds control prills comprising:

(i) fatty acid soap;

(ii) at least one quaternary ammonium salt having at least one aliphatic hydrocarbon substituent containing from about 12 to about 18 carbon atoms; and

(iii) at least one silicone fluid suds suppressor;

wherein said prills comprise from about 0.1% to about 14% by weight said silicone fluid, wherein said prills comprise from about 5% to about 55% by weight said soap, wherein the mole ratio of said soap to said quaternary ammonium salt in said prills is from about 0.1:1 to about 4:1, and wherein said composition comprises from about 1% to about 20% by weight of said prills.

4,637,891

PROCESS FOR THE MANUFACTURE OF DETERGENT COMPOSITIONS CONTAINING SODIUM ALUMINOSILICATE

Francois Delwel, Dordrecht, and Marinus L. M. Claassens, Roosendaal, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 358,989, Mar. 17, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 695,742

Claims priority, application United Kingdom, Mar. 20, 1981, 8108807

Int. Cl.[4] C11D *17/06*

U.S. Cl. 252—135 2 Claims

1. A process for manufacturing washing powder comprising a synthetic aluminosilicate as a detergency builder, said process comprising the sequence of steps of:

(a) spray-drying a slurry comprising (i) a detergent active material selected from the group consisting of anionic surfactants, nonionic surfactants, a binary mixture of anionic and nonionic surfactants and a ternary mixture of an anionic surfactant, a nonionic surfactant and a soap and (ii) sodium silicate, to form a spray-dried powder;

(b) granulating the spray-dried powder obtained in step (a) with a liquid binder and a detergency builder comprising a synthetic aluminosilicate to form granules in an apparatus separate from the apparatus in which spray-drying step (a) takes place; and

(c) drying the granules obtained in step (b).

4,637,892

CLEANING SOLUTION

Ora S. Merryman, 1711 Lewis, Las Vegas, Nev. 89101

Filed Feb. 4, 1986, Ser. No. 826,011

Int. Cl.[4] C11D *3/42*

U.S. Cl. 252—139 10 Claims

1. An improved, all purpose aqueous cleaning solution and deodorizing stain remover for use in cleaning natural and synthetic materials and fabrics, said solution comprising:

from 2 to 25% aromatic petroleum solvent;

from 2 to 25% aqueous wetting agent;

from 2 to 25% hydrated sodium borate; and

from 25 to 94% water.

4,637,893

DELAYED CO-INITIATION PROCESS FOR PREPARING POLYOL BLENDS

Curtis J. Reichel; William W. Levis, Jr., both of Wyandotte, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 458,287, Jan. 17, 1983, abandoned. This application May 16, 1985, Ser. No. 734,850

Int. Cl.[4] C09K *3/00*

U.S. Cl. 252—182 7 Claims

1. A delayed co-initiation process for preparing polyol blends comprising

(a) oxyalkylating a first initiator compound which contains at least two active hydrogen atoms to obtain a polyol with an equivalent weight from 100 to 10,000; and

(b) adding a second initiator which may be the same as or different from the first and oxyalkylating to obtain a polyol with an equivalent weight from 100 to 10,000 based upon the second initiator, said oxyalkylations occurring at temperatures from about 105° to about 160° C., wherein said first and second initiator is a polyhydric alcohol.

4,637,894

ACTIVATOR OF PEROXO COMPOUNDS

Jan Smidrkal; Jaroslav Simunek, both of Rakovnik; Jiri Tolman, Krivoklat; Jiri Soucek, Prague; Alois Novacek, Usti; Jan Novak; Vaclav Krob, both of Racovnik; Pavel Kovar, Prague; Miroslav Klofec, and Bohumir Vondracek, both of Usti, all of Czechoslovakia, assignors to Tukovy Prumysl, Koncern, Prague, Czechoslovakia

Filed Feb. 28, 1985, Ser. No. 706,511

Claims priority, application Czechoslovakia, Feb. 29, 1984, 1387-84

Int. Cl.[4] C01B *15/00*

U.S. Cl. 252—186.4 7 Claims

1. An activator of peroxo compounds comprising from 4 to 98 percent by weight of phthalic anhydride and from 2 to 96 percent by weight of N-acetylphthalimide.

4,637,895

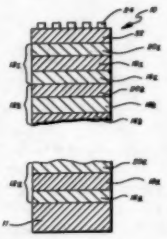
GAS MIXTURES FOR THE VAPOR DEPOSITION OF SEMICONDUCTOR MATERIAL

Stanford R. Ovshinsky, Bloomfield Hills; Subhendu Guha, Clawson; Prem Nath, Rochester; Chi C. Yang, Troy; Jeffrey Fournier, St. Clair Shores, and James Kulman, Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 1, 1985, Ser. No. 718,661

Int. Cl.[4] C09K *11/07*

U.S. Cl. 252—188.31 9 Claims



1. A gaseous precursor mixture from which semiconductor alloy material may be deposited by glow discharge decomposition:

said mixture including disilane and germane.

4,637,896

POLYMERIC LIQUID CRYSTALS

Paul J. Shannon, Millersville, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

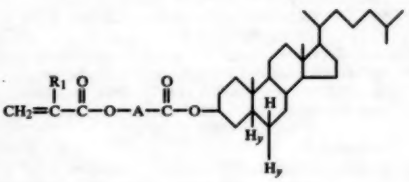
Continuation-in-part of Ser. No. 450,089, Dec. 15, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,038

Int. Cl.[4] C09K *19/36, 19/38;* C08F *12/32;* G01K *11/16*

U.S. Cl. 252—299.7 16 Claims

1. A polymeric coating exhibiting a fixed cholesteric optical response, said coating being obtained by photopolymerizing a composition comprising

a photopolymerizable monomer having the structure:



(I)

where R_1=H or CH_3, A=$—R_2—$, $—R_3O—$, or $—R_4O—$, R_2=an alkylene chain having from 3–14 methylene or lower alkyl-substituted methylene groups, R_3=an alkylene chain having from 2–14 methylene or lower alkyl-substituted methylene groups, R_4=an alkylene ether, diether or triether having a total of from 3–14 carbon atoms in the alkylene moieties, provided that the terminal alkylene moiety adjacent the carbonate moiety comprises not less than two carbon atoms, and y=0 or 1; and

a suitable photoinitiator, said composition having exhibited cholesteric liquid crystalline properties at the time photopolymerization occurred.

4,637,897

NEMATIC COMPOUNDS

Stephen M. Kelly, Oberrohrdorf, Switzerland, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

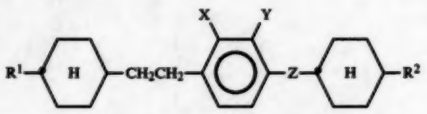
Filed Aug. 6, 1984, Ser. No. 638,089

Claims priority, application Switzerland, Aug. 4, 1983, 234/83; Fed. Rep. of Germany, Mar. 23, 1984, 3410734

Int. Cl.[4] C07C *49/84, 43/225, 39/42, 69/75, 25/13, 121/52, 121/56;* **C09K** *19/30*

U.S. Cl. 252—299.63 **19 Claims**

1. In a liquid crystalline dielectric comprising at least two liquid crystalline compounds, the improvement wherein at least one of these compounds is a nematic compound with a negative dielectric anisotropy of the formula

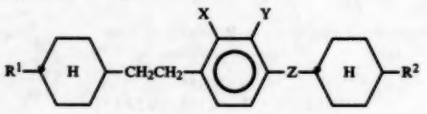


R^1 and R^2 are identical or different and each is alkyl of 1–12 carbon atoms,

Z is a bridging group which is $—CH_2CH_2—$, $—OCH_2—$, —O—CO— or —CO—O— and,

one of X and Y is flourine, chlorine, bromine or cyano and the other is hydrogen.

2. A compound of the formula



wherein

R^1 and R^2 are identical or different and each is alkyl of 1–12 carbon atoms,

Z is a bridging group which is $—CH_2CH_2—$, $—OCH_2—$, —O—CO— or —CO—O— and,

one of X and Y is fluorine, chlorine, bromine or cyano and the other is hydrogen.

4,637,898

FLUORESCENT COMPOSITIONS, X-RAY INTENSIFYING SCREENS, AND PROCESSES FOR MAKING SAME

Charles D. DeBoer, and George W. Luckey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 238,404, Feb. 26, 1981, abandoned. This application Apr. 8, 1985, Ser. No. 721,130

Int. Cl.[4] C09K *11/02*

U.S. Cl. 252—301.36 **13 Claims**

1. A fluorescent coating composition comprising:

(a) from 50 to 90 percent by weight of a substantially isotropic phosphor which is excited by x-rays and substantially transparent to light emitted by said phosphor; and

(b) from 10 to 50 percent by weight of a polymer having an index of refraction within 0.02 of the index of refraction of said phosphor over at least 80 percent of the emission spectrum of said phosphor, said polymer comprising:

(i) from 5 to 99 mole percent of a polymerized co-polymerizable naphthyl carbinyl methacrylate monomer; and

(ii) from 1 to 95 mole percent of a polymerized co-polymerizable naphthyl carbinyl thioacrylate monomer.

4,637,899

CORROSION INHIBITORS FOR CLEANING SOLUTIONS

Weldon C. Kennedy, Jr., Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jan. 30, 1984, Ser. No. 574,837

Int. Cl.[4] C11D *7/32*

U.S. Cl. 252—542 **22 Claims**

1. An aqueous cleaning solution composition having a pH of from about 1 to about 10, consisting essentially of at least one organic acid, selected from the group consisting of alkylene polyamine polyacetic acid, hydroxyacetic acid, formic acid, and citric acid, or a salt thereof, and further having dissolved or dispersed therein, in at least an amount sufficient to inhibit the corrosion of metals in contact with said solution, a corrosion inhibitor composition comprising:

(1) at least one of an aliphatic pyridinium salt or an aliphatic quinolinium salt; and

(2) a sulfur-containing compound.

4,637,900

FABRICATION OF HIGH EXPOSURE NUCLEAR FUEL PELLETS

James R. Frederickson, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 13, 1984, Ser. No. 570,553

Int. Cl.[4] G21C *21/02;* **C09K** *11/04;* **B22F** *1/00, 3/16*

U.S. Cl. 252—643 **10 Claims**

1. A method of making a fuel pellet for a nuclear reactor comprising

(A) preparing a mixture of PuO_2 and UO_2 powders, said mixture containing at least about 30% PuO_2, where at least 12% by weight of said Pu is Pu^{240},

(B) adding to said mixture about 0.3 to about 5% of a binder having a melting temperature of at least about 250 F. selected from a group consisting of fatty acid diamides, polyvinyl carboxylate, polyvinyl alcohol, naturally occurring high molecular weight cellulosic polymers, chemically modified high molecular weight cellulosic polymers, and mixtures thereof;

(C) pressing said mixture at about 5000 to about 25,000 psi to form a slug;

(D) granulating said slug;

(E) adding to said granulated slug a positive amount up to about 4.7% of a lubricant having a melting point of at least about 330° F., selected from the group consisting of fatty acid diamides, polyvinyl carboxylate, polyvinyl alcohol, naturally occurring high molecular weight cellulosic polymers, chemically modified high molecular weight cellulosic polymers, and mixtures thereof;

(F) pressing said granulated slug at about 20,000 to about 70,000 psi to form a pellet; and

(G) sintering said pellet at about 1700° C.±200° C.

4,637,901
N-(ALPHA-HALOACYL)-N-HYDROCARBYL CARBAMOYL HALIDES

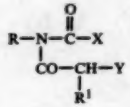
Chennupati K. Rao, Bhopal; Sudershan K. Arora, Hatam Tai; Raman Grover, Bhopal, all of India; John A. Durden, Raleigh, and Themistocles D. J. D'Silva, Chapel Hill, both of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 743,277, Jun. 11, 1985, abandoned, which is a continuation of Ser. No. 533,725, Sep. 19, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 786,721

Int. Cl.[4] C07C *125/03*

U.S. Cl. 260—544 C 14 Claims

1. Carbamoyl halide compounds of the formula:



wherein:

R represents methyl or alkenyl, alkynyl, cycloalkyl, cycloalkenyl, of up to 18 carbon atoms; R^1 represents hydrogen or methyl; and X represents Cl or F and Y represents Cl, F or Br.

4,637,902
MIXED ANHYDRIDES OF CARBAMIC AND HYDROXAMIC ACIDS

Hiroyuki Hirai, and Ken Kawata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

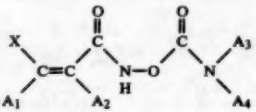
Filed Mar. 14, 1984, Ser. No. 589,289

Claims priority, application Japan, Mar. 14, 1983, 58-42673

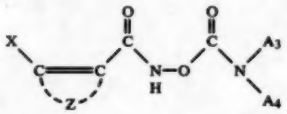
Int. Cl.[4] C07C *83/10, 125/00*

U.S. Cl. 260—545 R 5 Claims

1. A compound represented by the following formula (A-1) or (A-2):



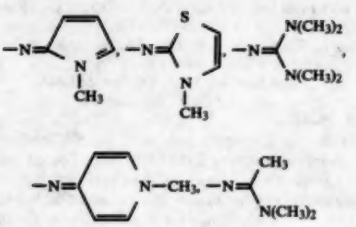
(A-1)



(A-2)

wherein A_1 and A_2 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an aryl group, a substituted aryl group, an acyl group, or a heterocyclic group, A_3 and A_4 each represents a hydrogen atom, an alkyl group, a substituted alkyl group, a cycloalkyl group, or an aralkyl group, and A_3 and A_4 can combine to form a ring or the group

represents an imino group selected from the group



and X represents a nucleophilic group, and

is a 5 or 6 member aromatic ring or a 5 or 6 membered heterocyclic group containing an oxygen atom, a sulfur atom or a nitrogen atom, wherein said substituted alkyl groups for A_1, A_2, A_3 and A_4 are substituted with one or more of a hydroxy group, an alkoxy group, a cyano group, a carboxyl group, a carboalkoxy group, a carbamoyl group or a halogen atom as a substituent and said substituted aryl group is substituted with one or more of an alkyl goup, an alkoxy group, a dialkylamino group, a cyano group, a nitro group, or a halogen atom as a substituent.

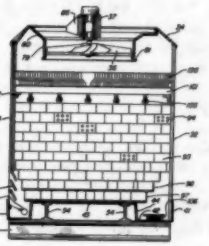
4,637,903
LIGHTWEIGHT COOLING TOWER

Charles J. Bardo; Jesse Q. Seawell, both of Fort Worth; Anthony J. Dylewski, Arlington, and John L. Clark, Jr., Benbrook, all of Tex., assignors to Ceramic Cooling Tower Company, Fort Worth, Tex.

Filed Oct. 30, 1985, Ser. No. 792,775

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—24 14 Claims



1. A cooling tower comprising:

a fiberglass reinforced resin basin,

porous means for heat/mass exchange which is supported directly by the basin,

a cover having a fan opening therein,

a plurality of vertically extending fiberglass reinforced resin columns which extend between the basin and the cover and which are supported by the basin and which support the cover,

a fiberglass reinforced resin panel extending between each pair of adjacent columns and attached thereto, and

a fan positioned in the fan opening in the cover and attached to the cover whereby the weight of the fan is supported by the cover and at least some of the columns.

4,637,904

PROCESS FOR MOLDING A POLYMERIC LAYER ONTO A SUBSTRATE

Nicholas A. Rounds, New Britain, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 14, 1983, Ser. No. 551,445
Int. Cl.[4] B29C *39/10, 39/42*
U.S. Cl. 264—1.4 19 Claims

1. Process for forming a polymeric layer affixed to a substrate comprising placing a substrate to be coated in a mold having a removable lid, injecting a liquid monomer, having a viscosity of from about 3 centipoises to about 500 centipoises, into said mold and into contact with the surface of the substrate to be coated, holding the substrate in place in said mold prior to curing said monomer, radiation curing said liquid monomer, releasing the hold on said substrate prior to significant shrinkage of the curing liquid monomer, and venting said mold to atmospheric pressure at the portion of the mold remote from the surface of the substrate being coated and prior to significant shrinkage of said liquid monomer and said substrate moves toward said removable lid while said mold and said removable lid remain stationary, and removing the substrate having a polymeric layer affixed thereto from the mold.

4,637,905

PROCESS OF PREPARING MICROCAPSULES OF LACTIDES OR LACTIDE COPOLYMERS WITH GLYCOLIDES AND/OR ε-CAPROLACTONES

David L. Gardner, Bellville, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 466,500, Feb. 18, 1983, Pat. No. 4,532,123, which is a continuation-in-part of Ser. No. 402,164, Jul. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 354,869, Mar. 4, 1982, abandoned. This application Apr. 11, 1985, Ser. No. 722,102
Int. Cl.[4] A61K *9/52;* B01J *13/02*
U.S. Cl. 264—4.3 6 Claims

1. A process for preparing a microcapsule having an aqueous functional core material encapsulated in a PLA which comprises:

(a) dissolving PLA in a mixture of two miscible organic liquids, the first being a liquid having solvent power for PLA and the second having little or no solvent power for PLA, the two liquids being present in a ratio such that the solution is near its saturation point for PLA, the liquid having solvent power for PLA having a vapor pressure significantly higher than the vapor pressure of the second liquid,

(b) agitating the solution of step (a) and adding thereto an aqueous functional core material so as to uniformly disperse the aqueous functional core material as a fine suspension throughout the continuous liquid phase having the PLA dissolved therein, and

(c) vaporizing the liquid having solvent power for PLA from the suspension of step (b) while continuing agitation so as to cause phase separation of the PLA and encapsulation of the finely dispersed aqueous functional core material with PLA, and

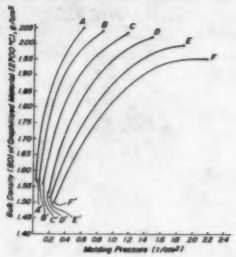
(d) transferring the dispersion of step (c) into an agitated mass of an organic liquid having little or no solvent power for PLA to precipitate any remaining dissolved PLA and harden the PLA which has encapsulated the aqueous functional core material.

4,637,906

METHOD OF PRODUCING CARBON MATERIALS

Noriyoshi Fukuda, and Ken Nagasawa, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 20, 1985, Ser. No. 713,865
Claims priority, application Japan, Mar. 26, 1984, 59-57892
Int. Cl.[4] C01B *31/02*
U.S. Cl. 264—29.1 1 Claim



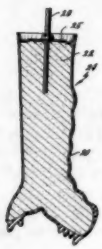
1. A method of producing carbon materials by starting from a calcined product having a benzene insoluble matter of more than 95% by weight, a quinoline insoluble matter of more than 80% by weight and a volatile matter of 4–15% by weight, which is produced by heat-treating coal tar pitch at 350°–600° C., extracting with a solvent, filtering and calcining the resulting residue having a quinoline insoluble matter of less than 95% by weight at a temperature of 250°–500° C. in an inert gas atmosphere, or a classified product obtained by classifying the calcined product into desired particle sizes and then molding, firing and graphitizing it without a binder, the improvement which comprises molding a calcined or classified product having an amount of quinoline soluble and benzene insoluble component of 1.5 to 15% by weight, under a pressure of not more than 1,000 kg/cm^2 without a binder, so as to obtain a carbon material having a bulk density of 1.85–2.05 g/cm^3.

4,637,907

LATEX DIP TOOLING AND METHOD FOR FORMING SAME

James D. Hegel, Torrance, and Davin W. Johnson, Rancho Palos Verdes, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 5, 1985, Ser. No. 720,337
Int. Cl.[4] B29C *67/22, 39/10;* C08J *9/34, 9/22*
U.S. Cl. 264—45.7 15 Claims



1. The method of forming a tool for use in a latex dip process for producing a latex skin in a given configuration, including the steps of:

producing an electro-formed female mold from a sculpture of the desired configuration;

casting a vinyl skin from said electro-formed female mold and removing said skin to expose a hollow interior; and

stuffing the vinyl skin with first and second materials, said first material being a ballast material, and said second material including one of glass balls and expanded, cellular beads, said first and second materials being selected in proportion for providing rigidity to said vinyl skin and approximately zero buoyancy for said tool in a latex bath.

4,637,908

PROCESS FOR MANUFACTURING HIGHLY ACTIVE, DISPERSED LOW APPARENT DENSITY ALUMINIUM HYDRATE

Fritz Weingärtner, Kerpen Horrem, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 9, 1985, Ser. No. 774,050

Claims priority, application Switzerland, Sep. 14, 1984, 4410/84

Int. Cl.⁴ C01F *7/02*

U.S. Cl. 264—143 **14 Claims**

1. Process for manufacturing highly active, low apparent density dispersed aluminum hydrate, which comprises: providing unground, very fine grained aluminum tri-hydroxide, of which more than 99% of the grains are at most 3 μm in size; introducing said aluminum tri-hydroxide continuously into a reactor along with a dry hot air stream, said aluminum tri-hydroxide being heated to 400°–600° C., whirled up in a circulating movement, strongly dispersed and partially dehydrated to contain about 1–8 wt. % water in less than about 4 seconds; removing said partially dehydrated aluminum oxide from the reactor in an air stream; providing a stationary condition in the reactor whereby the amount of partially dehydrated aluminum oxide flowing out of said reactor is the same as the amount of aluminum tri-hydroxide being added; precipitating said aluminum oxide flowing out of the reactor in the air stream; dispersing said precipitated aluminum oxide in water and heating said dispersion, as a result of which the aluminum oxide is rehydrated and aluminum hydroxide is produced in the form of gelled-pseudo-boehmite and bayerite; and drying said aluminum hydroxide at temperatures below the activation temperature.

4,637,909

PROCESS FOR PRODUCING DOUBLE-LAYERED STRUCTURES

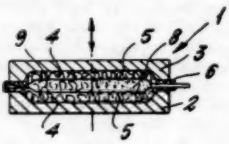
Eusebio Lucca, Viverone, Italy, assignor to Matec Holding, Switzerland

Filed Sep. 13, 1984, Ser. No. 650,110

Claims priority, application Italy, Sep. 13, 1983, 22859 A/83

Int. Cl.⁴ B29C *43/20, 49/22;* B32B *1/10*

U.S. Cl. 264—510 **2 Claims**



1. Process for the production of a closed hollow moulding substantially filled with an additional sound-absorbing material to provide for sound insulation of vehicles and engines in general by said molding, characterized by the steps of introducing a double package, each package comprising a prepolymerised or semipolymerised fibre layer and a foil of thermoplastics material, into a compression mould, the foils of the double package being disposed facing each other; providing a sound-absorbing material of sufficient porosity to allow a fluid under pressure to pass therethrough; placing a layer of said sound-absorbing material between said foils; introducing a fluid under pressure through said sound-absorbing material and between said foils in order to press each fibre layer against an internal wall of a corresponding compression mould half; applying heat of a temperature which is sufficient for melting said foil and polymerizing said fibre layers completely in order to provide a self-supporting, closed molding; and forming each of said fibre layers against said corresponding mold walls under said pressure and temperature and closing said molding by sealing edges of said packages together.

4,637,910

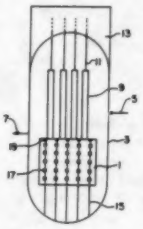
METHOD AND APPARATUS FOR CONTINUOUS ON-LINE SYNTHESIS OF POWER DISTRIBUTION IN A NUCLEAR REACTOR CORE

Albert J. Impink, Jr., Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,499

Int. Cl.⁴ G21C *7/36*

U.S. Cl. 376—216 **28 Claims**



1. A method of on-line synthesis of the local power in a nuclear reactor having rods which are inserted in and retracted from the reactor core axially to control the reactivity thereof and having fixed incore nuclear detectors distributed across the core, said method being operable despite misalignment of a rod and comprising the steps of:

generating and storing reference signals representative of the power in the core under reference conditions at a plurality of specified locations across the core including the location of the detectors and additional locations at which it is desired to determine the local power;

storing signals representative of the positions of the rods under the reference conditions;

detecting the positions of said rods with rod position indicators;

monitoring response signals generated by said detectors;

adjusting the detector response signals to substantially eliminate the local effects thereon of changes in rod position from the reference conditions as detected by the rod position indicators;

generating deviation signals as the fractional difference between the adjusted detector response signals and the stored reference signals for the detector locations;

determining from said deviation signals the location of any misalinged rods and adjusting said deviation signals to substantially eliminate the effects of such any misaligned rods;

generating signals representative of a fitting function fit to said deviation signals as adjusted;

generating signals representative of the deviation at each specified location from said fitting function signals;

adding to said deviation signals, signals representative of the fractional local effects on detector responses due to changes in rod position from said reference conditions as detected by said rod position indicators and due to any misaligned rods to generate current deviation signals for each specified location; and

multiplying said reference signals by one plus the current

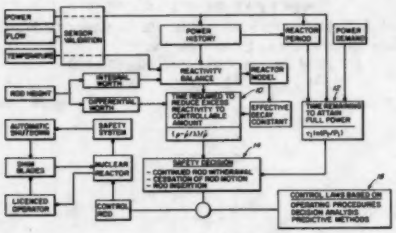
deviation signal for the corresponding specified location to generate current power signals representative of the current local power level at each specified location.

4,637,911

APPARATUS AND METHOD FOR CLOSED-LOOP CONTROL OF REACTOR POWER

John A. Bernard, Jr., Needham Heights, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 24, 1984, Ser. No. 633,939
Int. Cl.[4] G21C 7/36
U.S. Cl. 376—217 16 Claims



1. Apparatus for closed-loop control of reactor power in a nuclear reactor in which power level is altered by adjustments in reactivity balance comprising:

means for adjusting said reactivity balance; and

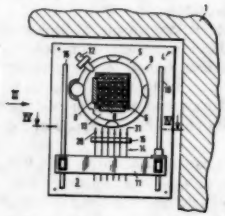
computing apparatus for computing repeatedly at intervals the two functions $[\rho-|\rho|/\lambda_e]/|\rho|$ and $\tau_i \ln(P_f/P_i)$; whereby net reactivity is limited by adjusting said reactivity balance when the two functions become equal.

4,637,912

APPARATUS FOR INSPECTING FUEL ASSEMBLIES, PARTICULARLY FOR DETECTING DEFECTIVE FUEL RODS FROM COMPLETE FUEL ASSEMBLIES OF WATER-COOLED NUCLEAR REACTORS

Rainer Scharpenberg, Waldmichelbach, and Günter Bäro, Weinheim, both of Fed. Rep. of Germany, assignors to Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 497,906
Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3219938
Int. Cl.[4] G21C 17/00
U.S. Cl. 376—245 9 Claims



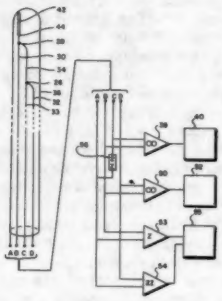
1. Apparatus for inspecting fuel assemblies, comprising a water container, a receptacle disposed in said container for securing bases of fuel assemblies vertically disposed in said container, a beam, a plurality of fingers engaged by said beam, measuring probes supported on said fingers, means disposed in said container at a given position relative to said receptacle for guiding said beam laterally toward said fuel assemblies for inserting said measuring probes in a given direction into spaces between cladding tubes of fuel rods of the fuel assemblies, means for fixing the position of said receptacle and said guiding means relative to each other, said position fixing means being in the form of a common base plate disposed in said container on which said guiding means and said receptacle are fastened, and means for permitting movement of said fingers relative to said given insertion direction after striking an obstacle.

4,637,913

DEVICE FOR MEASURING THE POWER IN A NUCLEAR REACTOR

Jean-Paul Jacquot, Paris, and Patrick Guillery, Saint Germain en Laye, both of France, assignors to Scandpower, Inc., Rockville, Md.

Filed Jul. 5, 1983, Ser. No. 510,591
Int. Cl.[4] G21C 17/00
U.S. Cl. 376—247 3 Claims



1. Device for measuring the local power in the core area of a nuclear reactor comprising:

a body which absorbs the gamma radiations placed at this area and a thermocouple with two junctions, one of which is arranged so that it is brought to the temperature of the body and the other of which is at a reference temperature directly connected to the temperature of the coolant of the reactor at this area during stablized operation of the reactor, which junctions are connected to the outside by insulated output conductive wires placed in a metallic sheath which traverses the reactor vessel;

an emitter is connected to one of the wires in the measuring area and that said measuring means are provided to measure the current between said sheath and said emitter, said emitter is made of a vanadium which supplies a collectron current which is a function of the neutron radiation; and

means placed outside the reactor for measuring the total current circulating between at least one of said output conductive wires and said sheath under the action of the neutron and gamma fluxes in the core.

4,637,914

QUICK RELEASE GUIDE SLEEVE ASSEMBLY

David E. Boyle, Kiski, and James R. Chrise, Trafford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 30, 1984, Ser. No. 574,839
Int. Cl.[4] G21C 7/00; F16B 9/00
U.S. Cl. 376—353 8 Claims

1. A quick release guide sleeve assembly, comprising:

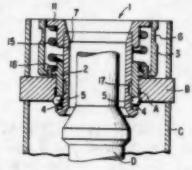
(a) an outer sleeve having an external circumferential surface and a cylindrical enlargement including a radial shoulder;

(b) an inner sleeve axially slidably received in said outer

sleeve and having first and second axial positions with respect to said outer sleeve;

(c) locking means movably mounted on said outer sleeve for frictionally engaging wall surfaces defining an opening for receiving the outer sleeve; said locking means having a locking position in which at least part of said locking means projects radially outwardly beyond said external circumferential surface of said outer sleeve; said locking means having a releasing position in which said locking means is in a radially inwardly withdrawn state relative to said circumferential surface of said outer sleeve;

(d) camming means carried on said inner sleeve for pressing



said locking means into said locking position in said first axial position of said inner sleeve and for allowing said locking means to assume said releasing position in said second axial position of said inner sleeve;

(e) spring means for urging said inner sleeve continuously into said first axial position; and

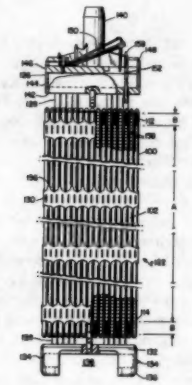
(f) a spring seat ring axially movably positioned adjacent said radial shoulder of said cylindrical enlargement and having portions projecting axially outwardly from said radial shoulder of said cylindrical enlargement in a direction away from said spring means; said spring means being in engagement with, and exerting an axial force, on said spring seat ring.

4,637,915

NUCLEAR REACTOR FUEL ASSEMBLY AND METHOD OF FORMING SAME

Thomas M. Camden, Jr., Washington Township, Fayette County, and Thomas R. Freeman, New Alexandria, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1984, Ser. No. 609,250
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—435 **11 Claims**



1. A nuclear fuel assembly comprising:

a top nozzle assembly;

a bottom nozzle assemble spaced from said top nozzle assembly

a plurality of guild thimble tubes extending between said top and bottom nozzle assemblies;

a plurality of spacer grid assemblies axially spaced along and attached to said guild thimble tubes;

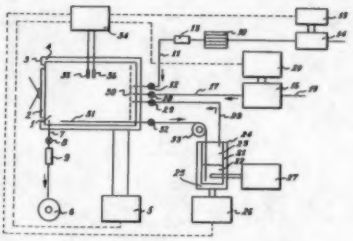
a plurality of fuel rods held in a spaced lateral array between said top and bottom nozzle assemblies by said spacer grid assemblies, each of said fuel rods comprising a fuel zone and a fission gas plenum zone wherein a first group of said fuel rods are disposed in said fuel assembly with said fission gas plenum zone adjacent said top nozzle assembly and a second group of said fuel rods are disposed in said fuel assembly with said fission gas plenums adjacent said bottom nozzle assembly and wherein the fuel zone of said first group of fuel rods is axially shifted with respect to the fuel zone of said second group of fuel rods.

4,637,916

STERILIZATION METHOD EMPLOYING A CIRCULATING GASEOUS STERILANT

Pierre Hennebert, Brussels; Jean Gillard, Tourinnes-La-Grosse, and Michel Roland, Brussels, all of Belgium, assignors to Universite Catholique de Louvain, Ottignies Louvain-la-Neuve and Manufacture Belge de Gembloux S.A., Gembloux, both of, Belgium

Filed Jan. 18, 1984, Ser. No. 571,765
Claims priority, application Belgium, Jan. 28, 1983, 895729
Int. Cl.[4] A01N *27/00*; A61L *2/20*
U.S. Cl. 422—36 **6 Claims**



1. A process for sterilizing a material or an article comprising the following steps in combination:

introducing the material or article to be sterilized into a chamber;

evacuating the chamber to a subatmospheric pressure;

admitting steam into the chamber to produce an increase in pressure until a temperature is attained within the chamber which is close to the desired sterilization temperature, while simultaneously maintaining a suction of steam and condensed water out of the chamber;

interrupting the admission of steam;

evacuating the chamber to a reduced pressure until the water which has condensed during the admission of steam has been removed;

bringing the chamber into communication with a gaseous phase containing formaldehyde to produce a gas mixture comprising the chamber atmosphere and the gaseous phase, said gaseous phase produced by evaporating an aqueous solution of formaldehyde which is kept at a constant temperature equal to the temperature desired for sterilization;

circulating the gas mixture from the chamber to the aqueous solution so that the gas mixture is continuously brought back into contact with the aqueous solution;

after the concentration of formaldehyde in the gas mixture has attained equilibrium with the aqueous solution, introducing a carrier gas into the chamber to increase pressure

therein until a total pressure at about atmospheric pressure is produced and maintained therein;

exposing the surface of the material or article within the chamber for a time required to produce sterilization under the condition of constant temperature, pressure, formaldehyde concentration and relative humidity by continuing to keep the gas mixture in circulation and continuously bringing it back into contact with the aqueous solution, maintaining the pressure within the chamber at about atmospheric pressure, and maintaining the temperature of the gas mixture at the desired sterilization temperature;

cutting off communication between the aqueous solution and the gas mixture present in the chamber;

removing the formaldehyde present in the chamber by evacuation;

bringing the interior of the chamber back to atmospheric pressure by introduction of said carrier gas; and

withdrawing the material or article.

4,637,917

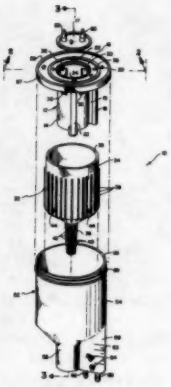
BUBBLE OXYGENATOR

Charles C. Reed, 5934 Hornwood, Houston, Tex. 77036; Denton A. Cooley, 3014 Del Monte, Houston, Tex. 77019; Terry N. Crane, 2801 Precinct Line Rd., Richmond, Tex. 77469; Edward A. Swanson, 9850 S. Kirkwood, Apt. 2008, Houston, Tex. 77099; Rolf A. Oscarsson, 1550 Winchell Dr., Hudson, Ohio 44236; Vern L. Liebmann, 1460 Meadowbrook Blvd., Stow, Ohio 44224, and Dan L. Cox, 14303 River Forest, Houston, Tex. 77079

Filed Oct. 14, 1983, Ser. No. 541,988

Int. Cl.[4] A61M *1/03*

U.S. Cl. 422—46 **33 Claims**



25. An apparatus for oxygenating blood comprising:

a first shell;

a heat exchanger concentrically spaced from said first shell so as to form an annular space between said first shell and said heat exchanger which serves as an oxygenating chamber;

first means for introducing venous blood into said oxygenating chamber;

second means for introducing an oxygen rich gas into said oxygenating chamber;

a second shell concentrically spaced from said first shell so as to form an annular space between said first and second shells which serves as a defoaming chamber, said defoaming chamber being substantially filled with a quantity of essentially porous material treated with a defoaming agent; and

a third shell concentrically spaced from said second shell so as to form an annular spaced between said second and third shells which serves as an arterial blood reservoir, and third shell comprising means for forming an essentially transparent view chamber for visually observing the level of blood in said reservoir, said view chamber having substantially parallel planar sides and having a generally uniform cross-sectional area such that the level of blood in the view chamber and the annular space between the second and third shells arises or falls at a substantially constant rate when blood is added to or withdrawn therefrom, said parallel planar sides being spaced relatively close together in relation to their height and width such that the sides deter the formation of a vortex as blood flows through the third shell.

4,637,918

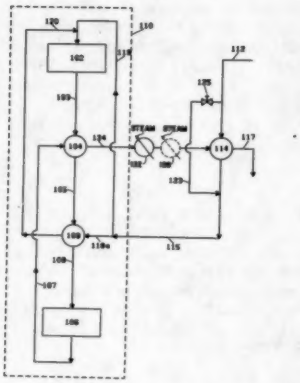
CATALYTIC GAS SYNTHESIS APPARATUS

Robert M. Osman, Parsippany, and Larry J. Shulik, Morristown, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 472,998, Mar. 7, 1983, Pat. No. 4,518,574. This application Jan. 14, 1985, Ser. No. 691,398

Int. Cl.[4] B01J *8/04*

U.S. Cl. 422—148 **14 Claims**

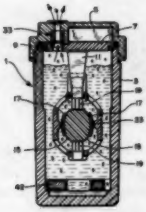


1. In an exothermic catalytic reactor having at least two catalytic beds arranged for sequential gas flow therethrough; gas supply means for introducing a gas feedstream to the first of said catalyst beds for partial reaction of said gas feedstream therein; interbed gas cooling means for cooling the gas effluent from each catalyst bed to remove heat therefrom prior to passing said gas effluent to the next of said sequentially arranged catalyst beds and means for removing a gaseous effluent from the last of such catalyst reactor beds as said gas product, the improvement wherein said reactor additionally comprises (a) reheat exchange means for heating at least a portion of said last catalyst bed effluent gas by indirect heat exchange with a heating fluid comprising at least a portion of the gaseous effluent from at least one other of said reactor beds prior to withdrawal of said product gas from said reactor; and (b) gas quenching means for introducing at least a portion of said gas feedstream as quenching fluid to at least one of (i) said heating fluid after removal of said heating fluid from said reheat exchange means, and (ii) the gaseous effluent from at least one of said catalyst beds other than said last bed or said bed from which said heating fluid is obtained.

4,637,919
LENS DISINFECTING APPLIANCE WITH IMPROVED VENTING FEATURE

Francis E. Ryder, and Richard Rabenau, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Nov. 5, 1984, Ser. No. 668,293
Int. Cl.[4] A61L *2/18*
U.S. Cl. 422—300 **3 Claims**



1. An appliance for disinfecting contact lenses or the like wherein said lenses are disposed within a disinfecting solution capable of being decomposed to cause a gas to be liberated, said appliance comprising: a container having a body with an open end; a cap assembly closing said container open end; lens holder means for supporting a pair of contact lenses being disposed within said container body; said cap assembly comprising an outer cap member and a disc member assembled in surface-to-surface abutting engagement, aligned openings formed in said outer cap member and said disc member defining a vent passageway for venting liberated gases from said appliance, an inner portion of an opening in said outer cap member and an outer portion of the opening in said disc member, each including a counter bore, which counter bores are adjacent to each other and define a chamber which is intermediate the ends of said vent passageway and bridges between the cap and disc members, a filter assembly disposed in said chamber and bridging between said outer cap and said disc member, said filter assembly including a tubular support member defining an inner bore and formed from a molded plastic material, a filter membrane formed from a gas permeable hydrophobic material supported by said tubular member as an integral component thereof, said membrane being insert molded with said tubular support member and disposed within said inner bore, said tubular support member having an outer diameter sized with respect to the diameter of said chamber, such that said filter assembly is press fitted within said chamber.

4,637,920
PROCESS FOR THE SEPARATION OF METAL COMPOUNDS BY REDUCTION

Adolfo Piuma, Spigno Monferrato, Italy, assignor to VA.NI.M S.r.l, Novara, Italy

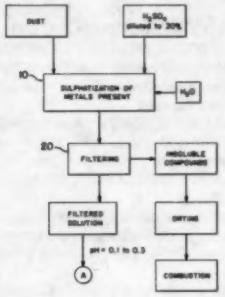
Filed May 14, 1985, Ser. No. 734,040
Claims priority, application Italy, Jun. 13, 1984, 12539 A/84
Int. Cl.[4] C01G *31/02*
U.S. Cl. 423—67 **5 Claims**

1. A process for the separation of vanadium and for the production of vanadium pentoxide from material selected from dust, sediment and ashes containing vanadium compounds and originating from the combustion of heavy fuels containing vanadium, in which the material is treated initially with sulfuric acid and then the resultant solution is filtered to separate the insoluble compounds from soluble sulfates comprising:

adding ammonia to the filtered solution until a pH of about 1.0 is reached,

cooling the solution to a temperature of about 25° C.,

passing the solution through a reduction column containing iron scraps to provide vanadium compounds wherein the valence of the vanadium is less than 5, the flow of liquid entering the reduction being adjusted so that the pH of the solution exiting from the bottom of the column is about 1.5 to 2.0, and



adding gaseous ammonia to the solution coming from the reduction column until the pH reaches a value of 5.5 to 6.5 whereby the vanadium precipitates in the form of insoluble compounds.

4,637,921
PROCESS FOR PRODUCING AMMONIUM POLYPHOSPHATE

James E. Sansing, 1709 Eton Ave., Asheboro, N.C. 27203, and Byron M. McCarver, 10821 Landsburg, Baton Rouge, La. 70809

Continuation-in-part of Ser. No. 449,052, Dec. 13, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 726,351
Int. Cl.[4] C01B *15/16, 25/26, 25/16*
U.S. Cl. 423—315 **3 Claims**

1. A process for producing ammonium polyphosphate, comprising in combination: sufficiently evaporating water from feed wet process phosphoric acid solution containing total P_2O_5 at a percentage substantially below about 50% by weight, such that phosphoric acid is obtained having a total P_2O_5 content of about 50% by weight; thereafter settling and removing coagulated-precipitate impurities therefrom; thereafter further evaporating therefrom additional water sufficiently to obtain an ortho-phosphoric acid having a total P_2O_5 content of at-least about 58% by weight of which a predominant proportion thereof is ortho-P_2O_5, thereafter settling and removing coagulated-precipitate impurities therefrom; thereafter mixing said ortho-phosphoric acid with anhydrous ammonia sufficiently to form a mixture, and introducing and treating said mixture in a pipe reactor by way of a feed pipe thereof, said introducing and treating consisting essentially of continuously first-feeding a feed of said mixture into a pipe reactor's evaporation zone while maintaining said evaporation zone at a predetermined temperature within a range of from about 475 degrees Fahrenheit to about 600 degrees Fahrenheit, and simultaneously continuously second-feeding an oppositely directed stream of heated gases consisting essentially of air and gaseous fuel combustion products into contact with said feed within said pipe reactor's evaporation zone at a volume and velocity of said gases at a velocity of from about 0.75 ft./sec. to about 10 ft./sec. such that said feed is entrained in said gas stream as entrained feed within said evaporation zone for a period up to about 5 seconds, said velocity being correlated with rate of said first-feeding, and thereafter continuously passing said entrained feed as a stream through a coalescence zone without cooling said stream more than about 10 degrees below said predetermined temperature sufficiently to produce a product comprising (a) ammonium polyphosphate thereof, of at least about 70% to about 74% of total P_2O_5 by weight of which non-ortho P_2O_5 is between about 71% and 75% by weight, and (b) an emmission of fluoride of low emmission, and continu-

ously removing said ammonium polyphosphate and said emision from said coalescence zone.

4,637,922

METHOD FOR REMOVING ORGANIC MATERIALS FROM A WET PROCESS PHOSPHORIC ACID

Masaki Nakatani, Tokuyama, and Yoichi Hiraga, Shin-nanyo, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 456,096, Jan. 6, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 814,298
Claims priority, application Japan, Jan. 18, 1982, 57-4829
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—321 R 2 Claims

1. A method for removing non-coloring organic materials from a wet process phosphoric acid obtained by treating an uncalcined Florida phosphate rock with sulfuric acid, comprising:

(i) contacting wet process phosphoric acid with at least one reducing material selected from the group consisting of chromium, nickel, copper, iron, tin, hypophosphorous acid, its salts and hydrazine; and then

(ii) further contacting said phosphoric acid contacted with a reducing material in step (i), with active carbon in the absence of a solid phase.

4,637,923

SYNTHETIC CRYSTALLINE SILICATE

Rosemarie Szostak, Cumming, Ga., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 27, 1985, Ser. No. 749,239
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 11 Claims

1. A synthetic porous crystalline material having a composition, on an anhydrous basis and in terms of moles of oxides per 100 moles of silica, expressed by the formula

$$(0\text{-}5)M_{2/n}O:(0.02\text{-}0.2)Al_2O_3:(100)SiO_2$$

wherein M is at least one cation having the valance n, said porous crystalline material being characterized by an X-ray diffraction pattern exhibiting values substantially as set forth in Table 1 of the specification.

4. The crystalline material of claim 3 wherein R is an organic cation derived from a diethylated, linear diquaternary compound having the formula

$$X(CH_3)_2(C_2H_5)N(CH_2)_4N(C_2H_5)(CH_3)_2X$$

wherein X is an anion.

4,637,924

CONTINUOUS SILICON CARBIDE WHISKER PRODUCTION

Ronald L. Beatty, Greer, and Floyd H. Wyman, Mauldin, both of S.C., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 331,331, Dec. 16, 1981, abandoned. This application Dec. 27, 1984, Ser. No. 686,780
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—345 12 Claims

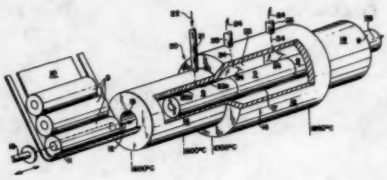
1. A method of obtaining silicon carbide whiskers on a substantially continuous basis from feed materials comprising carbon and silicon, comprising the steps of:

(a) substantially continuously feeding to a dehydrating zone materials comprising carbon and silicon and producing dehydrated materials which have a water content by weight of less than approximately one percent of the total composition of said materials;

(b) substantially continuously feeding the dehydrated materials formed in step (a) to a conversion zone;

(c) substantially continuously passing said dehydrated materials in an unagitated state through said conversion zone at temperatures of above approximately 1000° C. for a time sufficient for a portion of said materials to react to form silicon carbide whiskers;

(d) substantially continuously purging said conversion zone of gaseous reaction products; and



(e) exhausting said gaseous reaction products directly from said conversion zone before said products deposit on the interior surfaces of said zone or any adjacent processing zones.

4,637,925

ULTRAHIGH STRENGTH CARBON FIBERS

Tohru Hiramatsu, Matsuyama; Yohji Matsuhisa, and Tomitake Higuchi, both of Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 746,687, Jun. 20, 1985, Pat. No. 4,600,572. This application Apr. 23, 1986, Ser. No. 854,979
Claims priority, application Japan, Jun. 22, 1984, 59-127389; Jun. 22, 1984, 59-127390
Int. Cl.[4] D01C *5/06;* D01F *9/22*
U.S. Cl. 423—447.4 5 Claims

1. A process for producing an ultrahigh strength carbon fiber, which comprises the steps of:

electrochemically oxidizing an acrylic precursor based carbon fiber in an electrolyte solution comprising nitrate ions as the indispensable component and maintained at a temperature of at least 40° C. with an anode being said acrylic precursor based carbon fiber with a quantity of electricity of about 100 to 600 coulomb per gram of said fiber, followed by water washing and drying; heating the electrochemically oxidized carbon fiber in an inert or reductive atmosphere of about 600° to 1,000° C. to remove functional groups from said electrochemically oxidized carbon fiber.

4,637,926

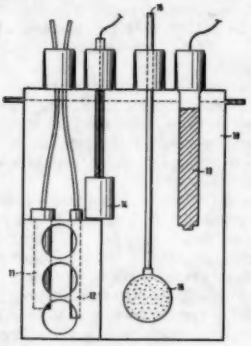
METHOD OF REMOVING HYDROGEN SULPHIDE FROM GASES

Emyr Phillips, Sale, and Brian Holt, Stretford, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

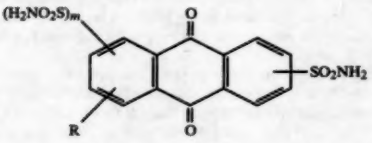
Filed Jul. 24, 1985, Ser. No. 758,013
Claims priority, application United Kingdom, Aug. 1, 1984, 84 19820
Int. Cl.[4] C01B *17/02;* B01D *53/34*
U.S. Cl. 423—573 R 12 Claims

1. Process for the absorption of hydrogen sulphide impurity from gases or liquid hydrocarbons comprising:

(a) washing the gas or liquid hydrocarbon containing hydrogen sulphide with an aqueous alkaline solution of



(a1) one or more compounds having the formula:



I

or a water-soluble salt thereof, wherein m is 0 or 1 and R is a hydrogen atom or a methyl or carboxy group, and

(a2) one or more compounds of a metal capable of existing in at least two valency states;

(b) removing sulphur formed by oxidation of hydrogen sulphide; and

(c) re-oxidising the hydroquinone formed from reduction of the compound of formula I.

4,637,927

PROCESS FOR ACCELERATING OF AMORPHIZATION OF INTERMETALLIC COMPOUNDS BY A CHEMICAL REACTION USING LATTICE DEFECTS

Masao Komatsu, Higashi-Osaka, and Hiroshi Fujita, Ibaraki, both of Japan, assignors to Osaka University, Suita, Japan

Filed Mar. 12, 1985, Ser. No. 711,441

Claims priority, application Japan, Sep. 14, 1984, 59-191644

Int. Cl.[4] C01B *6/24*

U.S. Cl. 423—644 **14 Claims**

1. A process for accelerating the amorphization of intermetallic compounds by a chemical reaction, said process comprising:

a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof;

b. treating said intermetallic compounds to provide lattice defects therein; and

c. reacting said treated intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce regions of amorphous hydrides of said treated intermetallic compounds, at least at said lattice defects, said elevated temperature ranging from a temperature effective to cause said chemical reaction to a temperature which does not equal or exceed the temperature at which said regions of amorphous hyrides crystallize.

11. Intermetallic compounds having regions of amorphous hydrides thereof prepared by a process for accelerating the amorphization of intermetallic compounds by a chemical reaction, said process comprising:

a. alloying a mixture consisting essentially of zirconium and aluminum to form intermetallic compounds thereof;

b. treating said intermetallic compounds to provide lattice defects therein; and

c. reacting said treated intermetallic compounds at an elevated temperature in a reaction chamber with a gas including hydrogen gas to produce regions of amorphous hydrides of said treated intermetallic compounds at least at said lattice defects, said elevated temperature ranging from a temperature effective to cause said chemical reaction to a temperature which does not equal or exceed the temperature at which said regions of amorphous hydrides crystallize.

4,637,928

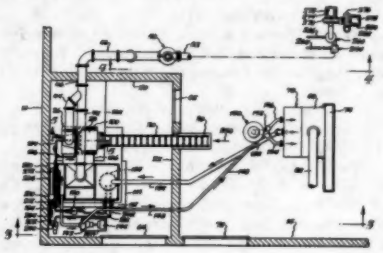
METHOD AND APPARATUS FOR NEUTRALIZING REACTIVE MATERIAL SUCH AS BATTERIES

William V. Zajac, Jr.; Henry G. Kautz, both of Clarence; David J. Kautz, Williamsville; Arthur J. Bossert, Clarence, and Sidney Cohen, Grand Island, all of N.Y., assignors to Greatbatch Enterprises, Inc., Clarence, N.Y.

Filed Aug. 6, 1982, Ser. No. 406,033

Int. Cl.[4] H01M *6/50, 10/42;* C01D *15/00;* C01G *21/00*

U.S. Cl. 423—659 **4 Claims**



1. A method for treating high energy density lithium batteries in a manner permitting safe disposal thereof, each of said batteries comprising a casing having reactive material therein, comprising:

(a) introducing said batteries to a hammermill to open the battery casings to allow access to the interiors thereof;

(b) simultaneously deluging said hammermill with an alkaline neutralizing liquid to introduce said liquid to the interiors of said opened casings to neutralize the reactive material in said casings, the blades of said hammermill increasing the velocity of said liquid flowing therethrough;

(c) collecting said liquid and opened casings exiting from said hammermill in a container holding a static quantity of said liquid;

(d) removing gas evolved during opening of said casings and neutralizing of said reactive material and cleaning the gas by scrubbing to remove any particulate contaminants therein;

(e) cooling the liquid in said container; and

(f) filtering the liquid in the container to remove particulate matter larger than a predetermined size.

4,637,929

FERRIOXAMINE-PARAMAGNETIC CONTRAST AGENTS FOR MR IMAGING, COMPOSITION, APPARATUS AND USE

Steven C. Quay, Menlo Park, Calif., assignor to Salutar, Inc., Sunnyvale, Calif.

Filed Jan. 4, 1985, Ser. No. 688,733

Int. Cl.[4] A61K *49/00;* A61B *5/05, 6/00*

U.S. Cl. 424—9 **24 Claims**

1. A chemically stable physiologically tolerable contrast

agent in a solid state form, for use in vivo solution during diagnostic magnetic resonance (MR) imaging, to enhance the MR image of the region of interest of a subject within the magnetic field of the MR system, comprising:

a composition of matter contrast agent having the form:

A-FOM,

where:

FOM is at least one member of the Ferrioxamine family of chelates selected from the group consisting of A, B, C, D1, D2, E, and F, which has a paramagnetic atom of ionized Fe for locally affecting the magnetic field of the MR system securely chelated therein at a plurality of coordination points to chemically isolate the Fe ion from the in vivo environment;

and

A is an amide group of the form having the chemical form: A=—NHCO—(CH2)(n—1)—CH3,

for functionally cooperating with the in vivo environment, wherein "n" is an integer indicating the number of Carbon atoms in the Carbon-Hydrogen portion of the amide group A; whereby the contrast agent causes a reduction in the T1 relaxation time near the region of interest within the subject.

4,637,930

TRANSDERMAL FORMULATION OF NICARDIPINE HYDROCHLORIDE

Yutaka Konno; Hiroitsu Kawata; Masayoshi Aruga; Takashi Sonobe, all of Saitama, and Mitsuo Mitomi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co, Ltd., Tokyo, Japan

Filed Jan. 31, 1985, Ser. No. 696,698

Claims priority, application Japan, Feb. 8, 1984, 59-21404; May 17, 1984, 59-99371; Jul. 26, 1984, 59-156288

Int. Cl.[4] A61F *13/00*; A61K *9/70*; A61L *15/00*

U.S. Cl. 424—28 12 Claims

1. A transdermal formulation containing 1 to 20 weight percent of a nicardipine hydrochloride and wherein said nicardipine hydrochloride is dissolved or suspended in a mixed liquid comprised of, based on the weight of said formulation:

(1) 0.3 to 30 weight percent of a urea, and

(2) at least one member selected from the group consisting of (a) 0.5 to 15 weight percent of propylene glycol, (b) 0.3 to 30 weight percent of thioglycol, (c) 0.3 to 30 weight percent of a monohydric alcohol having from 2 to 4 carbon atoms, (d) 0.3 to 10 weight percent of lactic acid, (e) 0.5 to 20 weight percent of mono- or di-esters of glycerol and fatty acids having 6 to 12 carbon atoms, and (f) 0.5 to 20 weight percent of mono- or di-esters of sorbitol and fatty acids having 6 to 12 carbon atoms, and said formulation containing a pharmaceutically acceptable carrier.

4,637,931

POLYACTIC-POLYGLYCOLIC ACID COPOLYMER COMBINED WITH DECALCIFIED FREEZE-DRIED BONE FOR USE AS A BONE REPAIR MATERIAL

John P. Schmitz, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1984, Ser. No. 658,945

Int. Cl.[4] A61K *31/74, 35/32*

U.S. Cl. 424—78 19 Claims

1. A method for promoting the healing of osseous tissue which comprises implanting at the site of the broken osseous tissue a therapeutically-effective amount of a composition comprising decalcified freeze-dried bone incorporated into a biodegradable polymeric matrix comprised of a copolymer of poly(L)(—)lactide co-glycolide.

11. A pharmaceutical composition useful in promoting the healing of broken osseous tissue comprising decalcified freeze-dried bone incorporated into a biodegradable polymeric matrix comprised of a copolymer of poly(L)(—)lactide co-glycolide.

4,637,932

PROCESS FOR PRODUCING A CONCENTRATE ENRICHED IN COAGULATION FACTORS VII AND VIIA

Nazreen Pancham, San Francisco, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 15, 1984, Ser. No. 660,762

Int. Cl.[4] A61K *35/16*

U.S. Cl. 424—101 13 Claims

1. An improved process for producing a concentrate consisting essentially of blood coagulation factors VII and VIIa and having a specific activity in the range of about 500 to 3000 u/A_{280} consisting essentially of the steps of:

(a) providing an aqueous solution of plasma proteins containing factors VII and VIIa;

(b) contacting the aqueous solution from step (a), adjusted to a pH of about 6 to 8, with an adsorbent having selective affinity for calcium-binding proteins, including factor VII, selected from the group of water-insoluble divalent metal salts, to adsorb calcium-binding proteins;

(c) selectively eluting, by techniques selected from step and gradient elution techniques, factors VII and VIIa from the protein-bound adsorbent from step (b) by the addition of a buffer solution containing suitable soluble salts effective to displace the bound proteins and collecting the eluate pool;

(d) contacting the eluate pool from step (c), adjusted to a pH of about 3 to 11, with an anionic exchange resin having affinity for the calcium-binding proteins, including factors VII and VIIa, and adsorbing thereon the calcium-binding proteins; and

(e) selectively eluting, by techniques selected from step and gradient elution techniques, factors VII and VIIa from the protein-bound adsorbent from step (d) by the addition of a buffer solution containing suitable salts in increasing ionic strength;

wherein the improvement comprises using as the starting aqueous solution containing coagulation factors VII and VIIa in step (a) an aqueous wash eluate, containing about 0.1–0.45M of at least one of ammonium bicarbonate, sodium bicarbonate and sodium chloride and containing 0.05–0.2M of citrate ions, said aqueous solution obtained by (i) contacting a Cohn Effluent I plasma fraction containing coagulation factors II, VII, IX and X with an anion exchange resin and (ii) washing the anion exchange resin having adsorbed thereto plasma proteins contained in said plasma fraction to remove those plasma proteins that are less strongly bound to the anion exchange resin so as to be removeable by contacting the anion exchange resin having adsorbed thereto said plasma proteins with a wash solution containing 0.1–0.45M of at least one of ammonium bicarbonate, sodium bicarbonate and sodium chloride.

4,637,933

COMPOSITION FOR CLEANING THE SKIN

Arlette Zabotto neé Arribau, Paris; Jean-Claude Contamin, Chilly Mazarin; Christian Zaffran, Elancourt, and Constantin Koulbanis, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 169,767, Jul. 17, 1980, abandoned, which is a continuation of Ser. No. 1,008, Jan. 4, 1979, abandoned. This application Jan. 18, 1985, Ser. No. 692,625

Claims priority, application Luxembourg, Jan. 6, 1978, 78831

Int. Cl.[4] A61K *33/24, 33/26*

U.S. Cl. 424—131 4 Claims

1. A cosmetic composition for cleansing the skin, in the form of an oil-in-water emulsion, consisting essentially of 5–30 percent by weight, based on the total weight of the composition, of an oil phase; 30 to 90 percent by weight, based on the total weight of the composition, of a water phase; 1 to 20 percent by weight, based on the total weight of the composition, of an emulsifying agent; and 1 to 30 percent by weight, based on the total weight of the composition, of a mineral phase; said mineral phase being a clay of the kaolinite type in the form of particles having a particle size of less than 60 microns wherein less than 15 percent by weight of said particles have a size

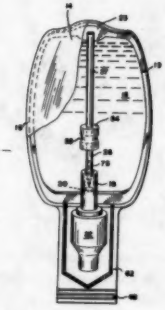
which is greater than 2 microns, said clay having a quartz content of less than 20 percent, a kaolinite content greater than 50 percent and a thixotropy less than or equal to 6.

4,637,934

LIQUID CONTAINER WITH INTEGRAL OPENING APPARATUS

Leonard A. White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1984, Ser. No. 599,426
Int. Cl.[4] A61J 9/00, 11/00; B65D 27/32
U.S. Cl. 426—117 18 Claims



1. A container for containing a fluid comprising:

at least one flexible wall defining an internal liquid compartment containing a quantity of liquid;

the flexible wall having a conduit extending therethrough the conduit having an inlet opening extending inside the container and an outlet opening which extends beyond the container;

the conduit having penetrable means located therein for closing the conduit; and

rigid means for penetrating the penetrable means, said rigid means being secured to and located inside the container and aligned to penetrate said penetrable means upon movement of said rigid means and said penetrable means together, said rigid means including a conduit for allowing fluid from inside the container to flow into said conduit in said flexible wall and out a dispensing means secured to the outlet opening.

4,637,935

PROCESS FOR MAKING A REDUCED DENSITY ROAST AND GROUND COFFEE

Steven J. Kirkpatrick; Steven A. Zoller, both of Cincinnati, Ohio, and Daniel L. Woods, Winter Haven, Fla., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1985, Ser. No. 793,592
Int. Cl.[4] A23F 5/08
U.S. Cl. 426—443 3 Claims

1. A process for making a reduced density roast and ground coffee product comprising the steps of:

(a) cracking roasted coffee beans to a size such that about 40% to about 80% are retained on a 6-mesh screen; then

(b) normalizing the cracked beans; and then

(c) grinding the cracked and normalized beans;

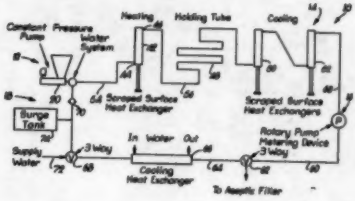
the coffee product produced having a density between about 0.24 g/cc and about 0.41 g/cc.

4,637,936

ASPETIC FOOD PROCESSING APPARATUS AND METHOD

James E. White, Overland Park, Kans.; Lewis F. Alley, Kansas City, Mo.; James E. Anderson, Shawnee Mission, Kans., and Jackie D. Birdsell, Kansas City, Mo., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Aug. 10, 1984, Ser. No. 639,955
Int. Cl.[4] A23L 3/18; F25B 29/00
U.S. Cl. 426—523 17 Claims



11. A method of continuously and aseptically processing and cooking a pumpable food product, comprising the steps of:

passing said product through constant pressure pump means for generating a substantially constant pressure stream of said product notwithstanding variations in processing conditions downstream of said pump means which would induce pressure variations in said stream;

heating said continuous, pressurized stream of product to a desired processing temperature;

holding said heated and pressurized stream in a holding zone for a period of time to assure aseptic cooking thereof; and

passing said cooked stream through metering means to meter the flow of said stream and create a substantially constant flow rate of the aseptically cooked product downstream of the holding zone.

4,637,937

PROCESS FOR MAKING CREAMY BACTERIA-FREE FOAMABLE OIL-IN-WATER EMULSION INCLUDING CHOCOLATE

Kimio Terada; Michio Mori; Yoichi Goto; Takashi Nakazawa; Kunio Muto, and Shozo Usami, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,242
Int. Cl.[4] A23D 5/02; A23G 1/00
U.S. Cl. 426—570 19 Claims

1. A process for making a creamy, bacteria-free, foamable oil-in-water chocolate emulsion comprising:

(a) emulsifying an aqueous phase containing a hydrophilic emulsifier and 3–30 wt. % of a chocolate component based on the weight of the emulsion with an oil phase containing a lipophilic emulsifier and 15–35 wt. % of oil based on the weight of the emulsion, wherein the total of all solid components in the resulting emulsion is from 40 to 60 wt. %;

(b) homogenizing said resulting emulsion by high pressure homogenization at a pressure of about 50–100 Kg/cm^2 and

(c) sterilizing said homogenized resulting emulsion by heating at ultra-high temperature.

4,637,938

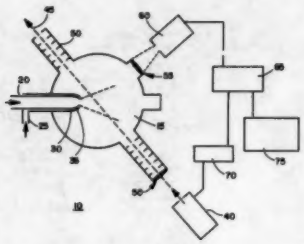
METHODS OF USING SELECTIVE OPTICAL EXCITATION IN DEPOSITION PROCESSES AND THE DETECTION OF NEW COMPOSITIONS

Henry Lee, Somerville; John P. deNeufville, Mendham, both of N.J., and Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 19, 1983, Ser. No. 524,923

Int. Cl.[4] B05D *3/06, 5/12*

U.S. Cl. 427—53.1 24 Claims



10. A method of depositing a semiconductor material on a substrate comprising the steps of:

generating a deposition reaction having a species which is a product of a chemical flow reaction using either a diffusion flame or plasma, said deposition reaction in operative contact with a substrate so that the product of said deposition reaction is a body of material deposited on said substrate;

perturbing said deposition reaction in situ by exciting an effective concentration of said species to an electronically excited state so that the deposited semiconductor material is modified, said species being a precursor to the deposited semiconductor film; and

depositing said material on said substrate.

12. A method as defined in claim 10, wherein said excitation is laser induced.

4,637,939

OPTICAL ADHESIVE COMPOSITION

Tooru Maruno, Hino; Kouzaburou Nakamura, Tokyo, and Shigekuni Sasaki, Iruma, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Division of Ser. No. 647,637, Sep. 6, 1984, Pat. No. 4,591,627. This application Feb. 7, 1986, Ser. No. 827,059

Claims priority, application Japan, Sep. 9, 1983, 58-165268; Nov. 21, 1983, 58-217794; Nov. 29, 1983, 58-223087; Jun. 15, 1984, 59-121914; Jun. 15, 1984, 59-121915; Aug. 9, 1984, 59-167232

Int. Cl.[4] B05D *5/06*

U.S. Cl. 427—162 1 Claim

1. A process for the production of optical members, comprising the steps of: preparing a mixture of a composition essentially containing a diglycidyl ether selected from the group consisting of diglycidyl ether of bisphenol-AF and diglycidyl ether of 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluorooctane-1,8-diol; a reactive diluent selected from the group consisting of butyl glycidyl ether, phenyl glycidyl ether, allyl glycidyl ether, glycidyl ether of butane-diol and diglycidyl ether of 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluorooctane-1,8-diol and 4[perfluoro-1,3-dimethyl-2-(1-methylethyl)-1-butenyl-]-oxyphthalic anhydride acting as a hardener; defoaming said mixture; coating the defoamed mixture on an optical member; and then heating said member and said mixture coated thereon to harden said mixture.

4,637,940

ELASTOMER-COATED BIAS REINFORCEMENT FABRIC AND METHOD FOR PRODUCING SAME

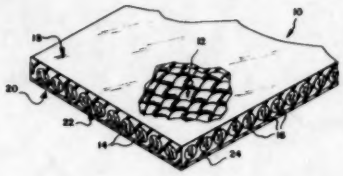
Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 652,394, Sep. 20, 1984, Pat. No. 4,565,715, which is a division of Ser. No. 533,098, May 16, 1983, Pat. No. 4,490,428, which is a continuation-in-part of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771. This application Oct. 15, 1985, Ser. No. 787,830

The portion of the term of this patent subsequent to Apr. 25, 2001, has been disclaimed.

Int. Cl.[4] B05D *3/12*

U.S. Cl. 427—176 1 Claim



1. In a method for manufacturing elastomer-coated, bias fabric comprising:

a. transversely stretching a bias fabric having opposed surfaces, yarns, or fiber bundles, and interstices between said yarns or fiber bundles,

b. applying an elastomeric latex composition to both surfaces of said fabric while said fabric is maintained transversely stretched, such that said composition substantially penetrates the interstices of said fabric and provides an elastomeric coating of substantially uniform thickness, and

c. drying said coated latex composition, the improvement which comprises:

prior to stretching said bias fabric, pre-impregnating said bias fabric with a liquid non-elastomeric composition which facilitates the impregnation of said fabric by an elastomer but does not stabilize the orientation of said yarns or bundles in said fabric, said liquid non-elastomeric composition comprising water and an impregnation facilitating agent disposed in said water.

4,637,941

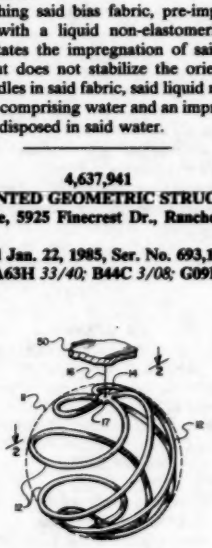
SEGMENTED GEOMETRIC STRUCTURE

Randall S. Rochte, 5925 Finecrest Dr., Rancho Palos Verdes, Calif. 90274

Filed Jan. 22, 1985, Ser. No. 693,104

Int. Cl.[4] A63H *33/40;* B44C *3/08;* G09F *21/00*

U.S. Cl. 428—8 15 Claims



1. A segmented geometric structure comprising a plurality of spirally formed curvilinear segments where the top and bottom end of each said segment is respectively joined to form a single structure where said structure has a vertical axis pro-

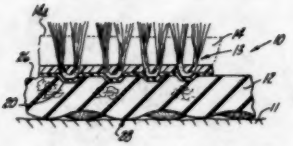
jecting from the top joint or north pole junction and the bottom joint or south pole junction.

4,637,942

SYNTHETIC GRASS PLAYING FIELD SURFACE

Seymour A. Tomarin, St. Catharines, Canada, assignor to Tecsyn Canada Limited, St. Catharines, Canada

Filed Sep. 23, 1985, Ser. No. 779,322
Int. Cl.[4] A01N *3/00*
U.S. Cl. 428—17 **13 Claims**



1. A game playing surface, particularly for active running and body contact sports, such as football and the like, formed of a synthetic pile carpet positioned upon a stabilized, substantially flat base surface, comprising:

a relatively thick underpad laid upon the base surface, with said underpad formed of small size, irregularly shaped, closely packed resilient particles which are bonded together into a resilient, relatively dense mass;

the underpad having a substantially flat, rough upper surface and a lower surface with relatively large, relief-type, indentations that are widely and regularly spaced apart to form rounded substantially domed cavities whose open bottoms are covered by the overlapping portions of the base surface;

a pile carpet laid over the upper surface of the underpad and formed of substantially equal length, upwardly extending, relatively densely packed synthetic fibers fastened at their lower ends to a carpet base sheet so that the fibers provide a generally grassy appearance;

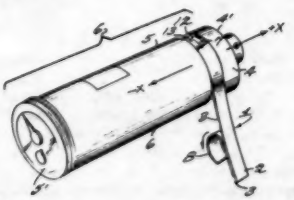
whereby the playing surface provides good foot support for lateral foot movements and resiliently absorbs and disperses foot and body impact forces.

4,637,943

SEALED SPLIT INSTRUMENT HOUSING WITH FOIL-BACKED ACRYLIC TRANSFER ADHESIVE TEARBAND

George D. Bennett, Shelburne, Vt., assignor to Simmonds Precision, New York, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,471
Int. Cl.[4] B60R *13/06*; C09J *7/02*
U.S. Cl. 428—35 **16 Claims**



1. A hermetically sealed and structurally joined split aircraft instrument housing assembly made of at least two parts having abutting edges, said assembly comprising:

two adjacent chamber subassemblies forming an abutting joint of their edges;

a metallic foil strip of predetermined thickness; and

an acrylic transfer adhesive strip of predetermined thickness adhesively affixed to one side of said metallic foil strip thereby forming a tearband;

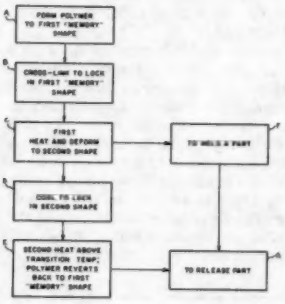
said tearband being adhesively attached, through said acrylic transfer adhesive, to each of said subassemblies about said abutting joint whereby said split housing assembly is assembled and substantially hermetically sealed and structurally joined.

4,637,944

PROCESS AND DEVICE FOR TEMPORARILY HOLDING AND RELEASING OBJECTS

George E. Walker, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1985, Ser. No. 713,477
Int. Cl.[4] B29C *61/00*
U.S. Cl. 428—35 **33 Claims**


A
FORM POLYMER TO FIRST "MEMORY" SHAPE
B
CROSS-LINK TO LOCK IN FIRST "MEMORY" SHAPE
C
FIRST HEAT AND DEFORM TO SECOND SHAPE
TO HOLD A PART
D
COOL TO LOCK IN SECOND SHAPE
E
SECOND HEAT ABOVE TRANSITION TEMP; POLYMER REVERTS BACK TO FIRST "MEMORY" SHAPE
TO RELEASE PART

1. A process for a first part to temporarily hold and release a second part comprising the steps of:

forming a cross-linkable polymeric first part to a first memory shape;

cross-linking said polymeric first part to lock in said first memory shape;

heating said first memory shaped polymeric first part to a temperature above its transition temperature;

deforming said heated memory shaped polymeric first part to a second deformed shape so as to hold onto and surround at least a portion of a second part;

cooling said deformed second shaped first part to temporarily hold and surround the second part; and

heating said deformed second shaped first part above its transition temperature wherein said first part will revert from its deformed second shape to its first memory shape and wherein the held and surrounded second part will be released from said first part whereby said first part and said second part will be totally separated and independent from each other.

4,637,945

ANTI-STATIC JACKET FOR FLOPPY DISK

Takeshi Masui, Konosu, and Morio Sano, Tokyo, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1985, Ser. No. 733,283
Claims priority, application Japan, Jul. 23, 1984, 59-111347[U]
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—35 **27 Claims**

1. A jacket for floppy disk comprising an exterior layer of a material which is antistatic and is selected from the group consisting of a styrene base resin layer externally coated with an antistatic agent and a styrene base resin in admixture with at least one of antistatic agents, conductive carbons and conductive metals, and an interior non-woven cloth layer laminated

internally of said exterior layer, said styrene base resin being selected from the group consisting of high impact strength styrene resins, mixtures of a styrene resin for general uses mixed with at least 20 wt% of a high impact strength styrene resin, acrylonitrile/styrene/butadiene copolymers, methacrylonitrile/styrene/butadiene copolymers, styrene/butadiene block copolymers, acrylonitrile/acrylic rubber/styrene copolymers, acrylonitrile/ethylenepropylene rubber/styrene copolymers; acrylonitrile/chlorosulfonated ethylene/styrene copolymers, acrylonitrile/α-methyl-styrene/butadiene copolymers, nd blends thereof.

4,637,946

ROAD REPAIR MEMBRANE

Hasmukh G. Shah, and Dwight S. Musgrave, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 18, 1985, Ser. No. 799,220
Int. Cl.[4] B32B *3/26*; C08L *95/00*; E01C *3/06, 11/2*
U.S. Cl. 428—63 **4 Claims**

1. A membrane for installation upon an old cracked road surface to retard reflective cracking into a later-applied asphalt concrete overlay superimposed on the membrane, said membrane consisting essentially of a glass fiber mat having applied thereto, a binder consisting essentially of a blend of about 40–85% by weight unblown asphalt, about 6–15% by weight elastomer, and about 0–55% by weight mineral filler, the elastomer being a block copolymer having at least two monoalkenyl arene polymer end blocks and at least one elastomeric conjugated diene polymer midblock, and the maximum simulated traffic and thermal moduli of the binder do not exceed the following values:

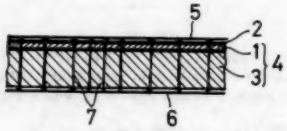
Temp.	
	Simulated Traffic Modulator at 2-Inch/Min.
0° F.	60,000
−10° F.	120,000
−20° F.	175,000
	Thermal Modulus at 6° F. Reduction/Hour
0° F.	6,000
−10° F.	10,000
−20° F.	20,000
−25° F.	25,000

4,637,947

HEAT INSULATION MATERIAL

Taijiro Maekawa, and Yukio Fujino, both of Tokyo, Japan, assignors to Anmin Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,642
Int. Cl.[4] A41D *13/00, 27/02*; A47G *9/00*; B32B *15/14*
U.S. Cl. 428—68 **11 Claims**



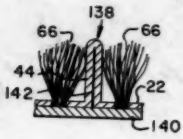
1. A permeable heat insulating material comprising a supporting material composed of fibrous material, a reflecting layer made of metal or non-metal formed on a surface of the supporting material, and a heat insulating fibrous layer laminated on another surface of of the supporting material; the heat insulating material being laminated so that the reflecting layer is placed outwardly, the supporting material is integrally fixed to the heat insulating layer, and the reflecting layer is formed on the surfaces of fibers or yarns of the fibrous sheet material composing the supporting material prior to lamination of the heat insulating layer thereto.

4,637,948

TUFTED WEATHERSTRIPPING WITH BARRIER FIN

Robert D. Evans, 44 Tubbs Springs Dr., Weston, Conn. 06883, and Robert C. Blezard, 29 Homestead St., North Smithfield, R.I. 02895

Filed Aug. 14, 1984, Ser. No. 640,666
Int. Cl.[4] D04H *11/00*
U.S. Cl. 428—89 **20 Claims**



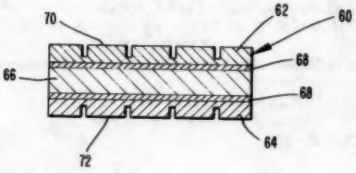
20. Weatherstripping comprising:
a strip of substrate having a barrier fin extending therefrom;
a resilient row of pile attached to the substrate and extending along each side of said barrier fin;
said barrier fin comprising sheet material folded upon itself and enveloping a core spaced from and extending parallel to said substrate, said core creating an enlargement along said barrier fin spaced from said substrate; and
each said row of pile being shorter in height than said barrier fin and engaging under said enlargement to resiliently support said enlargement in position.

4,637,949

SCRIM REINFORCED, FLAT CLOTH-LIKE COMPOSITE LAMINATE AND A METHOD OF MAKING

James H. Manning, and Wayne P. Sorenson, both of Appleton, Wis., assignors to James River Corporation, Richmond, Va.

Continuation of Ser. No. 627,631, Jul. 3, 1984, abandoned. This application Apr. 8, 1985, Ser. No. 720,808
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—110 **29 Claims**

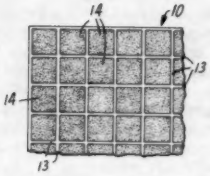


1. A method of making a flat cloth-like composite laminate comprising the steps of:
(a) inserting a scrim coated with a thermoplastic binder between two nonwoven layers, each of the nonwoven layers being formed of three-dimensional cellulosic fibers bound with a latex adhesive;
(b) heating the scrim and the two nonwoven layers to a temperature sufficient to activate the thermoplastic binder while maintaining equal tension on the scrim and the two nonwoven layers; and
(c) pressing the scrim and the two nonwoven layers together to form a flat cloth-like composite laminate having substantially all of each nonwoven layer of cellulosic fibers adhered to opposite sides of the scrim, the surface of each nonwoven layer being planar and interrupted by the scrim.

4,637,950
DELAMINATION-RESISTANT CELLULAR RETROREFLECTIVE SHEETING

David L. Bergeson, Mendota Heights; Lee A. Pavelka, Cottage Grove, and Barbara A. Mielke, Inver Grove Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1985, Ser. No. 729,369
Int. Cl.[4] B32B *3/28;* G02B *5/122*
U.S. Cl. 428—168 23 Claims



1. Retroreflective sheeting comprising (1) a base sheet having a layer of retroreflective elements disposed over one of its surfaces; (2) a polymeric cover film disposed in spaced relation from the layer of retroreflective elements; and (3) a network of narrow intersecting bonds extending between said cover film and base sheet to adhere the cover film and base sheet together and form a plurality of cells within which retroreflective elements are hermetically sealed; characterized in that the cover film comprises a continuous polymeric phase and a discontinuous polymeric phase, the film being biaxially oriented such that the discontinuous polymeric phase is in the form of minute disks distributed uniformly throughout the film.

4,637,951
FIBROUS MAT FACER WITH IMPROVED STRIKE-THROUGH RESISTANCE

Frederick A. Gill, and Mario P. Tocci, both of Littleton, Colo., assignors to Manville Sales Corporation, Denver, Colo.

Filed Dec. 24, 1984, Ser. No. 685,699
Int. Cl.[4] B32B *5/24, 17/10;* D04H *3/12*
U.S. Cl. 428—215 13 Claims

1. A porous, non-woven fabric mat for use as a facer, substrate, or carrier for receiving a curable substance while in the fluid state, said mat comprising a blend of dispersed, substantially randomly oriented fibers and a binder for holding said blend of fibers together;

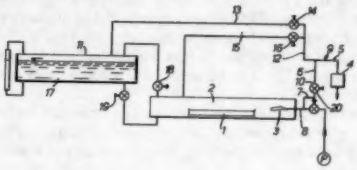
said blend of fibers comprising microfibers intermixed with base fibers said microfibers comprising between two percent (2%) and about forty percent (40%) of the total weight of said blend, said base fibers having a mean diameter of between about eight (8) microns and about twenty-five (25) microns;

said binder comprising a water miscible combination of a heat settable binder resin and an effective amount of a wet proofing polymer resin compatible with said heat settable binder resin, said wet proofing polymer being selected from a group consisting of a water based silicone elastomer and a fluorchemical emulsion.

4,637,952
METHOD FOR IMPREGNATING WOOD, AND AN APPARATUS FOR CARRYING OUT THE METHOD

Terje Rosenlund, Båtstangveien 12, N-3200 Sandefjord, Norway

PCT No. PCT/NO85/00007, § 371 Date Oct. 2, 1985, § 102(e) Date Oct. 2, 1985, PCT Pub. No. WO85/03474, PCT Pub. Date Aug. 15, 1985
PCT Filed Feb. 1, 1985, Ser. No. 789,970
Claims priority, application Norway, Feb. 2, 1984, 840397; Sep. 14, 1984, 843660
Int. Cl.[4] B05C *3/00;* B05D *1/18, 3/00;* C23C *14/00*
U.S. Cl. 427—297 11 Claims

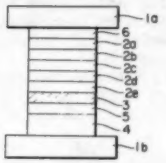


1. A method for impregnating wood by means of an impregnating liquid, comprising placing wood in an airtight, pressure resistant impregnation tank from which air is completely or almost completely evacuated, and subjecting impregnating liquid, following its introduction into the tank, to pressure, wherein the impregnating liquid is completely or almost completely de-aerated of its gas or air content before it is compressed in the impregnation tank, and wherein impregnation occurs under completely airtight conditions so that the impregnating liquid is completely or almost completely devoid of gas and air during impregnation when the liquid is penetrating into the wood, and gas or air has no opportunity to penetrate into the wood between the evacuation of the tank and impregnation of the wood.

4,637,953
MAGNETOOPTICAL RECORDING MEDIUM WITH LAMINATED ANTI-REFLECTION FILM

Mitsuharu Sawamura, Yokohama, and Susumo Ito, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,761
Claims priority, application Japan, Jun. 7, 1983, 58-100247
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—333 4 Claims



1. A magnetooptical recording medium comprising:

(a) a light transmissive substrate formed of a material selected from the group consisting of plastic and glass;

(b) a multilayer film disposed on said light-transmissive substrate, said multilayer film having an odd number of layers of at least 3 in number and being formed by alternate lamination of a high-refractive film which is a binary vapor-deposited film comprising a mixture of Ta_2O_5 and ZrO_2, and a low-refractive film containing SiO_2 as the main constitutent and the film in contact with said light-tramissive substrate being a high refractive film, wherein each of the layers of said multilayer film has an optical thickness of $\lambda/4$, where λ is a wave length of recording and readout light; and

(c) a recording magnetic layer disposed on said multilayer film wherein recording on said magnetic film is performed by a light beam traversing said substrate and said multilayer.

3. A magnetooptical recording medium comprising:

(a) a light transmissive substrate formed of a material selected from the group consisting of plastic and glass;

(b) a multilayer film disposed on said light-transmissive substrate, said multilayer film having an odd number of layers of at least 3 in number and being formed by alternate lamination of a high-refractive film which is a binary vapor-deposited film comprising a mixture of Nb_2O_5 and ZrO_2, and a low-refractive film contaiing SiO_2 as the main constituent and film in contact with said light-transmissive substrate being a high refractive film, wherein each of the layers of said multilayer film has an optical thickness of $\lambda/4$, where λ is a wave length of recording and readoug light; and

(c) a recording magnetic layer disposed on said multilayer film wherein recording on said magnetic film is performed by a light beam traversing said substrate and said multilayer.

4,637,954

RESIN-TREATED WOODY MATERIAL

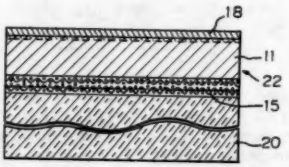
Hisayoshi Ohsumi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 7, 1985, Ser. No. 763,470

Claims priority, application Japan, Aug. 8, 1984, 59-166017; Oct. 30, 1984, 59-228370

Int. Cl.[4] B32B *21/04*

U.S. Cl. 428—342 1 Claim



1. Resin-treated woody material comprising

a crude board of a thickness in a range from 0.1 to 0.6 mm and made of natural wood,

colorant applied to one face of said crude board,

a thermo-setting powdered resin applied to said one face of said crude board over said colorant at an amount from 10 to 300 g/m^2, and

a backing applied to the other face of said crude board at an amount from 10 to 200 g/m^2.

4,637,955

WIRE INSULATED WITH A FLUOROCARBON POLYMER COMPOSITION

Frank J. Glaister, Ipswich, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Division of Ser. No. 549,500, Nov. 7, 1983, abandoned. This application Oct. 26, 1984, Ser. No. 665,373

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—379 1 Claim

1. A wire product comprising an electrical conductor and an extruded insulation coating thereon, the coating comprising an irradiation crosslinked composition having a melting point of at least 240° C. prior to irradiation and having been extruded about the conductor and thereafter crosslinked by radiation at a dose level of up to about 40 megarads or more; said composition comprising an ethylene-tetrafluoroethylene copolymer and about 1% wt. to about 50% wt. of polyvinylidene fluoride.

4,637,956

SIZED GLASS FIBERS AND REINFORCED POLYMERS CONTAINING SAME

Balbhadra Das, Pittsburgh; Chester S. Temple, McKees Rocks, and Carl A. Melle, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,758

Int. Cl.[4] B32B *9/00*; D02G *3/00*

U.S. Cl. 428—391 16 Claims

1. Strands of treated glass fibers that are useful in reinforcing polymeric matrices, wherein the treatment is a dried residue of an aqueous chemical treating composition. comprising:

a. an aqueous dispersion of: an ungelled, cationic resinous reaction product of a polyepoxide and primary or secondary amine, where the reaction product has free epoxy functionality and has active hydrogens, and in combination with the reaction product, blocked crosslinkable polyisocyanate which is stable at ordinary room temperature in the presence of active hydrogen containing resin but which is reactive with the active hydrogens of said resinous reaction product at elevated temperatures,

b. one or more organo coupling agents,

c. one or more cationic or nonionic lubricants, and

d. water in an effective amount to provide for the treatment of the glass fibers with the aqueous chemical treatment composition to yield abbut 0.1 to about 5 weight percent solids of the treating composition on the glass fibers.

4,637,957

FINISH COMPOSITION FOR POLYESTER FIBER FOR RUBBER REINFORCEMENT

Shigemitsu Murase, Joyo, Japan, assignor to Unitika Limited, Osaka, Japan

Division of Ser. No. 687,039, Dec. 28, 1984, abandoned, which is a division of Ser. No. 533,011, Sep. 16, 1983, Pat. No. 4,520,050. This application Apr. 14, 1986, Ser. No. 852,380

Claims priority, application Japan, Dec. 29, 1982, 57-234195

Int. Cl.[4] B32B *27/36*

U.S. Cl. 428—395 13 Claims

1. Polyester yarn having applied thereon a fiber finish composition in an amount sufficient to provide improved adhesion of said polyester yarn to rubber, said fiber finish composition comprising an oil portion, said oil portion comprising an effective amount of lubricant and 3 to 30 weight percent of the initial condensation product and its intermediate of a melamine resin.

4,637,958

METHOD FOR IMPROVING THE ADHESION OF ELASTOMERS TO A COATED SUBSTRATE

Karl-Heinrich Wegehaupt, Burghausen, and Hans-Rudolf Pfeffer, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 5, 1985, Ser. No. 720,466

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418406

Int. Cl.[4] B32B *15/08*; C09J *5/04*

U.S. Cl. 428—416 16 Claims

1. A method for improving the adhesion of elastomers derived from compositions which are crosslinked by a condensation reaction and are based on diorganopolysiloxanes containing rod-shaped copolymers formed by the free-radical copolymerization of styrene and (meth)acrylic acid ester in the presence of the diorganopolysiloxanes, to an undercoating based on epoxy resin and pitch or tar, which comprises applying to the undercoating a primer composition containing in an organic solvent,

(a) a copolymer of a (meth)acrylic acid ester free of silicon atoms and a (meth)acryloxyalkylsilane having at least one SiOC-bonded monovalent organic group; and

(b) a silane which contains a SiC-bonded organic group having at least one amino or imino group and which

contains at least one SiOC-bonded monovalent organic group, or a partial hydrolyzate of such a silane, or mixtures thereof and thereafter applying a crosslinkable composition to said primer composition.

9. A coated substrate having an epoxy resin and pitch or tar coating thereon, a primer having SiC-bonded organic groups over said epoxy resin and pitch or tar coat and an overcoat over said primer of a composition which is crosslinked to form an elastomer by a condensation reaction, in which the elastomer is based on diorganopolysiloxanes containing rod-shaped copolymers formed from the free-radical copolymerization of styrene and (meth)acrylic acid ester in the presence of the diorganopolysiloxanes, said primer is obtained from an organic solvent solution containing

(a) a copolymer of a (meth)acrylic acid ester free of silicon atoms and a (meth)acryloxyalkylsilane having at least one SiOC-bonded monovalent organic group; and

(b) a silane which contains a SiC-bonded organic group having at least one amino or imino group and which contains at least one SiOC-bonded monovalent organic group, or a partial hydrolyzate of such a silane, or mixtures thereof.

4,637,959
MAGNETIC RECORDING MEDIUM

Yoshinobu Ninomiya; Masashi Somezawa, and Kiyokazu Oiyama, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,377
Claims priority, application Japan, Oct. 28, 1983, 58-202345
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—425.9 **52 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon composed mainly of magnetic powder and a binder, said binder containing a thermoplastic polyurethane-urea resin hardened by a polyisocyanate and having at least one hydrophilic polar group selected from the group consisting of the groups represented by general formulas:

$$-SO_3M,\ -OSO_3M,\ -COOM \text{ and } -\underset{\underset{O}{\|}}{P}(OM')_2$$

wherein M is hydrogen or alkali metal and M' is hydrogen, alkali metal or hydrocarbon group, the total concentration of urea groups and urethane groups in said resin being between 1.8 and 3 m mol/g, and the concentration ration between urea groups and ureathane groups in said resin being between 0.3 and 1.6.

39. A magnetic recording medium comprising a non-magnetic substrate, a magnetic layer formed on one surface of said non-magnetic substrate and a back coating layer composed of a binder and non-magnetic pigment formed on the other surface of said non-magnetic substrate, said binder containing a thermoplastic polyurethane-urea resin hardened by a polyisocyanate and having at least one hydrophilic polar group selected from the group consisting of the groups represented by general formulas:

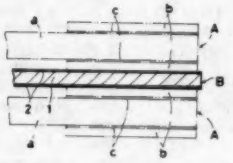
$$-SO_3M,\ -OSO_3M,\ -COOM \text{ and } -\underset{\underset{O}{\|}}{P}(OM')_2$$

wherein M is hydrogen of alkali metal and M' is hydrogen metal or hydrocarbon group, the total concentration of urea groups and urethane groups in said resin being between 1.8 and 3 m mol/g, and the concentration ratio between urea groups and urethane groups in said resin being between 0.3 and 1.6.

4,637,960
SPACER FOR FURNACE BRAZING HAVING LOW WETTABILITY COATING THEREON

Toshio Hatakeyama, Kawagoe, and Toshihiko Yoshio, Hidakamachi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,836
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—469 **7 Claims**



1. A spacer for use between articles being brazed for preventing a brazing filler metal from flowing from one of said articles to another of said articles when said articles are being brazed, said spacer comprising:

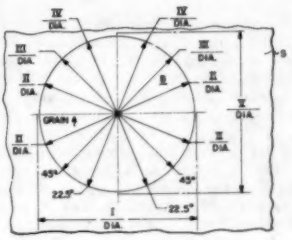
a main body made of a steel plate selectd from the group consisting of hot rolled steel and stainless steel; and

a coating on a top side surface and a bottom side surface of said main body of an inorganic substantce which is low in wettability in relation to the brazing filler metal and repelling said brazing filler metal during brazing for preventing one of said articles at one side of said spacer from being brazed to said spacer and to another of said articles.

4,637,961
SHELL FOR CAN ENDS

Henry C. Bachmann; Omar L. Brown; Ermal C. Fraze; David K. Wynn, all of Dayton, and James R. Gregg, Springboro, all of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Continuation of Ser. No. 571,243, Jan. 16, 1984, abandoned. This application Aug. 22, 1985, Ser. No. 768,162
The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.
Int. Cl.[4] B21D *53/00*
U.S. Cl. 428—579 **10 Claims**



1. A method of forming shells for use in the manufacture of can ends, comprising the steps of:

forming a rounded non-circular blank from a sheet of thin metal, said blank having a greater width across the grain of the metal than along such grain;

then forming into said blank a substantially flat central panel and an upward-extending chuck wall about the edge of said panel to produce a partially formed shell, the junction area between said panel and said chuck wall defining a relatively large radius of curvature;

forming into said blank a lip extending outward from the

upper end of said chuck wall and generally parallel to said panel;

separately gripping the entire panel and said chuck wall and causing relative movement between said panel and said chuck wall and simultaneously wrapping said junction area round a forming punch to form a panel wall in said junction area extending upward from the inner part of said chuck wall.

4,637,962

COMPOSITE MATERIAL IN ROD, TUBE, STRIP, SHEET OR PLATE SHAPE WITH REVERSIBLE THERMOMECHANICAL PROPERTIES AND PROCESS FOR ITS PRODUCTION

Joachim Albrecht, Mülligen, Switzerland, and Thomas Duerig, Fremont, Calif., assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 6, 1984, Ser. No. 586,837

Claims priority, application Switzerland, Mar. 14, 1983, 1383/83-7

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.[4] C23C *30/00*

U.S. Cl. 428—616 **17 Claims**

1. An article having reversible thermomechanical properties, comprising at least two parts, whereby each part has a memory effect, wherein the entire article is made up of at least one shape memory alloy having a two-way effect.

4,637,963

MAGNETIC RECORDING MEDIUM AND METHOD FOR MAKING

Masaharu Nishimatsu; Toshiaki Ide; Yoshiaki Saito, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 673,029

Claims priority, application Japan, Nov. 17, 1983, 58-216573

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—694 **10 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate having opposed major surfaces, a non-magnetic undercoat on one major surface of the substrate, and a magnetic layer on the undercoat, characterized in that said undercoat is formed of an undercoating composition comprising 100 parts by weight of a radiation curable base resin and about 0.1 to 50 parts by weight of an anti-static agent, the composition being cured through crosslinking by exposure to radiation, the magnetic recording medium further comprising a non-magnetic backcoat on the other major surface of the substrate, wherein said backcoat is formed of a backcoating composition comprising 100 parts by weight of a radiation curable base resin and about 0.1 to 50 parts by weight of an anti-static agent and 0.1 to 100 parts by weight of a pigment, the composition being cured through crosslinking by exposure to radiation.

4,637,964

MAGNETIC RECORDING MEDIUM

Yoshiro Shimuzu, and Yoshio Tada, both of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

Filed Jul. 12, 1985, Ser. No. 754,867

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—694 **3 Claims**

1. A magnetic recording medium comprising a magnetic powder binder, which comprises, by weight, 5–90% of a polymer having a molecular weight of 5000–200,000 and containing therein, based on the weight of said polymer, at least 2% of an alkenyl phenol.

4,637,965

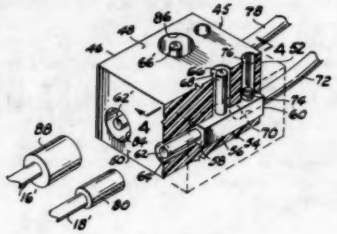
ANTICORROSION BATTERY TERMINAL

Ronald G. Davis, Erick, Okla., assignor to H. Milton Keathley and Douglas Michael Phenix, both of Erick, Okla.

Filed Nov. 22, 1985, Ser. No. 800,872

Int. Cl.[4] H01M *2/30*

U.S. Cl. 429—1 **1 Claim**



1. In a vehicle lead acid storage battery having terminal posts and a pair of elongated pigtail leads respectively integrally connected at one end portion with said posts, the improvement comprising;

electrically insulated connector means including a receptacle portion indicating polarity on the other end portion of each lead of said pair of pigtail leads; and,

a plug portion remote from the battery electrically connecting the receptacles with a conductor,

said plug portion comprising,

a plug body from dielectric material having opposing spaced-apart parallel end surfaces and having a top surface normal to the end surfaces,

a pair of elongated electrically conductive terminals embedded in parallel spaced relation within said dielectric material body between said end surfaces,

a first prong projecting axially toward said one end surface from one end of each terminal and terminating adjacent but spaced inwardly with respect to said one end surface,

an axial socket formed in the other end of each terminal for electrical connection with vehicle cable conductors,

said dielectric material body having first and second polarity indicating cylindrical recesses respectively surrounding the first and second prongs; and,

a laterally projecting prong on each terminal intermediate its ends projecting toward said top surface,

said top surface having other polarity indicating recesses respectively surrounding the laterally projecting prongs.

4,637,966

SEALED LEAD-ACID CELL

Toshio Uba, Lakewood, and Robert F. Nelson, Aurora, both of Colo., assignors to Gates Energy Products, Inc., Denver, Colo.

Division of Ser. No. 544,333, Oct. 21, 1983. This application Jul. 28, 1986, Ser. No. 890,250

Int. Cl.[4] H01M *10/06*

U.S. Cl. 429—57 **8 Claims**

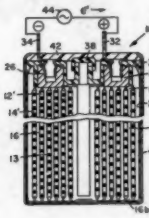
1. A normally sealed gas recombining lead-acid cell having a high rate discharge capability utilizing an "oxygen cycle" comprising:

a container;

at least one porous positive plate and at least one porous negative plate within the container, both plates having been electrochemically formed in situ in the container;

a separator material interleaved between and in firm pres-

sure contact with the plates, comprised of a mat of microfine glass fibers having a BET surface area of from about 0.2 to about 1.5 m^2/g and a porosity of from about 70 to about 98 percent; and,



liquid sulfuric acid electrolyte substantially fully absorbed within the pores of the plates and separator, the quantity of electrolyte being limited such that the pore volumes of the plates and the separator are less than fully filled.

4,637,967

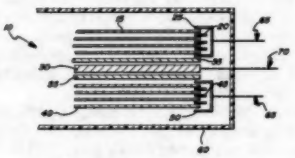
ELECTRODES MADE WITH DISORDERED ACTIVE MATERIAL AND METHODS OF MAKING THE SAME

John E. Keem, Bloomfield Hills; Richard C. Bergeron, Romulus; Russell C. Custer, Clawson, and R. William McCallum, Birmingham, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 546,651, Oct. 28, 1983, abandoned. This application Aug. 29, 1985, Ser. No. 770,704

Int. Cl.[4] H01M *4/86, 4/90*

U.S. Cl. 429—101 **33 Claims**



1. A hydrogen storage electrode for an alkaline hydrogen storage electrochemical cell comprising at least one solid, metallic, amorphous electrochemically active body, capable of being self-supporting and formed by rapid solidification from a melt thereby having a non-particulate, dimensionally anisotropic shape characterized by a continuous amorphous structure throughout, said body having a composition comprising at least three elements, said three elements comprising titanium, nickel and at least one element selected from the group consisting of aluminum, boron, chromium, cobalt, hafnium, indium, lead, magnesium, molybdenum, niobium, palladium, tin, zirconium and rare earth metals, each of said elements preset in an effective amount so that said electrode is capable of being electrochemically charged with hydrogen to store energy and capable of electrochemically discharging hydrogen and releasing energy, while maintaining its structural integrity during electrochemical charge and discharge cycles.

4,637,968

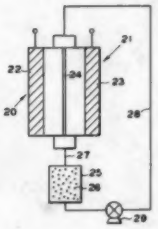
SOLID BROMINE COMPLEXERS

Patrick G. Grimes, Westfield, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 7, 1986, Ser. No. 837,273

Int. Cl.[4] H01M *10/36*

U.S. Cl. 429—105 **9 Claims**



1. A metal halogen electrochemical cell comprising:

an aqueous electrolyte containing a metal halide, the metal thereof being selected from zinc and cadmium;

an electrode at which to deposit said metal of said metal halide during charging of said cell;

a counterelectrode at which to generate the halogen of said metal halide during charging of said cell; and

anion exchange resin for storing the halogen generated during charging of the cell and providing a source of halogen during discharging of said cell.

4,637,969

PHOTOELECTRO-CHEMICAL CELL FOR CONVERSION OF SOLAR ENERGY TO ELECTRICITY AND METHOD OF ITS MANUFACTURE

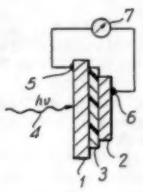
Terje Skotheim, 41 Bay Rd., East Patchoque, N.Y. 11772, and Michel Armand, E.N.S.E.E.G.-Domaine Universitaire-BP44, Saint Martin d'Heres, 38401, France

Division of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Apr. 23, 1982, Ser. No. 371,318

The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

Int. Cl.[4] H01M *6/36*

U.S. Cl. 429—111 **16 Claims**

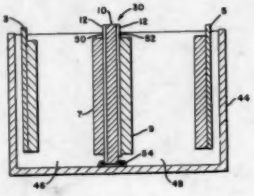


1. A photoelectric device comprising: a transparent counter electrode; a thin dry solid film polymer electrolyte adjacent thereto and electrically interacting therewith; a semiconductor adjacent to said polymer electrolyte film; and a conducting base electrode electrically interacting with said semiconductor.

4,637,970
LEAD-TITANIUM, BIPOLAR ELECTRODE IN A LEAD-ACID BATTERY

Lun-Shu R. Yeh, Summit; Morten Grenness, Califon, and Robert J. Fuller, Hackettstown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 21, 1984, Ser. No. 684,755
Int. Cl.[4] H01M *10/18*
U.S. Cl. 429—153 **7 Claims**



1. An electrochemical battery apparatus for producing electrical power, comprising:

(a) a container for containing an electrolyte;

(b) at least one bipolar electrode for generating said electrical power, which is located in said container to separate said container into a first compartment and a second compartment, said bipolar electrode comprised of

(i) a base member, which is comprised of a core portion composed of titanium,

an integral, substantially continuous and non-porous layer of lead, which is electroplated onto at least one face surface of said core portion and diffused a selected, limited distance into said core portion, and

a substantially continuous, residual layer in said core portion that is substantially free of lead,

(ii) a negative-type active mass connected to a first face surface of said base member,

(iii) a positive-type active mass connected to a second face surface of said base member;

(c) a positive electrode located in said first compartment of said container;

(d) a negative electrode located in said second compartment of said container; and

(e) sealing means for preventing leakage of electrolyte around said bipolar electrode between said first and second compartments of said container.

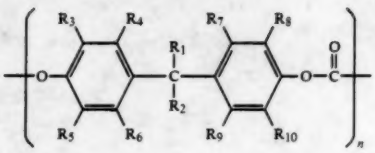
4,637,971
PHOTORECEPTOR HAVING POLYCARBONATE LAYERS AND PROCESS FOR THE PREPARATION THEREOF

Yoshiaki Takei; Hiroyuki Nomori, and Katumi Matuura, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

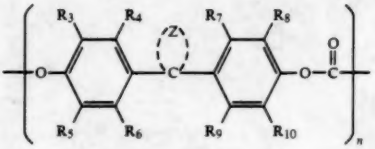
Filed Feb. 11, 1985, Ser. No. 700,671
Claims priority, application Japan, Feb. 16, 1984, 59-28309
Int. Cl.[4] G03G *5/04*
U.S. Cl. 430—59 **32 Claims**

1. A photoreceptor comprising a photosensitive layer and a support wherein said photosensitive layer comprises a carrier generation layer and a carrier transport layer wherein said carrier generation layer and/or said carrier transport layer contains a polycarbonate compound represented by the following Formula (A) or (B) as a binder

formula [A]



formula [B]



wherein R_1 and R_2 are independently hydrogen atom, substituted or unsubstituted aliphatic group, or substituted or unsubstituted hydrocarbon ring provided that at least one of R_1 and R_2 has at least 3 carbon atoms, Z represents a group of atoms necessary for constituting a substituted or unsubstituted carbon ring or a substituted or unsubstituted heterocyclic ring, R_3 to R_{10} in Formulas (A) and (B) are independently a hydrogen atom, a halogen atom, a substituted or unsubstituted aliphatic group or a substituted or unsubstituted hydrocarbon ring, and n is a number from 10 to 1000.

4,637,972
LIGHT RECEIVING MEMBER HAVING AN AMORPHOUS SILICON PHOTOCONDUCTOR

Kyosuke Ogawa, Tokyo; Shigeru Shirai, Yamato; Keishi Saitoh, Tokyo; Teruo Misumi, Kawasaki, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 592,802, Mar. 23, 1984, abandoned.
This application Dec. 30, 1985, Ser. No. 815,123
Claims priority, application Japan, Mar. 28, 1983, 58-52033; Apr. 2, 1983, 58-58348; Apr. 2, 1983, 58-58350
Int. Cl.[4] G03G *05/082*
U.S. Cl. 430—84 **15 Claims**

1. A light-receiving member having a substrate and a light-receiving layer having photoconductivity containing an amorphous material comprising a matrix of silicon atoms provided on said substrate, said light-receiving layer having, from the said support side with respect to the layer thickness direction of said layer, a first layer region containing atoms of the group III of the periodic table at higher concentration toward the side of the substrate, wherein the first layer region comprises a layer region A and a layer region B successively from the side of the substrate, in which the content of group III atons in the layer region A is 30 to 5×10^4 atomic ppm, and the thickness of the layer region A is 20 Å to 20μm, and a second layer region containing atoms of the group III of the periodic table and nitrogen atoms, wherein the content of group III atoms in the second layer region is 0.01 to 1×10^4 atomic ppm and the thickness of the second layer region is 20 Å to 15μm.

4,637,973

IMAGE FORMING PROCESS FOR ELECTROPHOTOGRAPHY

Kunio Shigeta; Yoko Yamamoto, and Jiro Takahashi, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,652
Claims priority, application Japan, Nov. 15, 1984, 59-239540; Nov. 16, 1984, 59-240542; Nov. 26, 1984, 59-247971
Int. Cl.[4] G03G 9/14
U.S. Cl. 430—122 20 Claims

1. A process for forming an image comprising:

forming a latent image on a movable latent image bearing member, said movable latent image bearing member comprising an organic photoconductive photosensitive member;

forming a magnetic brush comprised of a two-component developer, which includes a toner and a carrier, on a movable developer carrying member, said movable developer carrying member having at least a portion thereof opposed to said latent image bearing member in a developing region;

moving said latent image bearing member and said developer carrying member in a developing region; and

developing said latent image on said latent image bearing member by brushing it with said brush in said developing region;

said developer carrying member comprising a single movable sleeve;

said latent image bearing member and said single sleeve of said developer carrying member moved in the same direction in said developing region at respective linear velocities; and

the ratio V_S/V_P of the linear velocity of said single sleeve of said developer carrying menber V_S to the linear velocity of said latent image bearing member V_P being within the range of $1.9 \leqq V_S/V_P \leqq 4$.

4,637,974

XEROGRAPHIC COPYING ON A TRANSPARENT SHEET

Raymond G. Kubit, Fox River Grove, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 485,208, Apr. 15, 1983. This application Jan. 10, 1985, Ser. No. 691,352
Int. Cl.[4] G03G 13/16
U.S. Cl. 430—126 4 Claims

1. In a method of making a xerographically imaged transparency wherein an unimaged transparent copy sheet is imaged in a plain paper-type copier, said copier embodying a photoconductive surface on which a toner image is formed, said copy sheet comprising a transparent base film having a transparent coating thereon adapted for receiving and for having fixed thereto a toner image transferred from said photoconductive surface, said copier also embodying an opacity sensor which controls the operation of the copier and which is activated by copy sheet opacity, the improvement for activating indiscriminately the sensors of different copiers having diverse opacity location requirements and for activating such sensors with the transparent copy sheet in any angular disposition in which it is received by their respective copiers, which comprises employing in said method a transparent copy sheet in order to activate said sensor with an opaque border therein that extends completely around the sheet and encompasses on unimaged transparent area of the sheet.

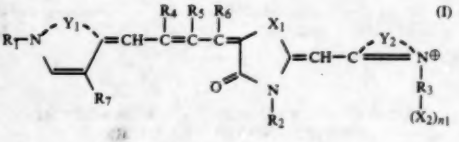
4,637,975

HEAT-DEVELOPABLE PHOTOGRAPHIC MATERIALS

Seiiti Kubodera; Takanori Hioki, and Masaki Okazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 6, 1985, Ser. No. 773,163
Claims priority, application Japan, Sep. 6, 1984, 59-186855
Int. Cl.[4] G03C 1/02
U.S. Cl. 430—353 19 Claims

1. A heat-developable photographic material comprising a support having thereon at least one heat-developable photographic layer containing a light-sensitive silver halide sensitized by an infra-red sensitizing dye represented by formula (I)



(I)

wherein

R_1 and R_3 each represents an unsubstituted or substituted alkyl group or alkenyl group;

R_2 represents a hydrogen atom or an unsubstituted or substituted alkyl group, aryl group, alkenyl group, or aromatic heterocyclic group;

R_4 through R_7 each represents a hydrogen atom or an unsubstituted or substituted alkyl group, aryl group, or alkenyl group; or R_4 and R_6 together form an unsubstituted or substituted alkylene group or alkenylene group;

X_1 represents an oxygen atom, a sulfur atom, or the group

wherein R_8 represents a hydrogen atom, an unsubstituted or substituted alkyl group, aryl group, or alkenyl group;

Y_1 represents an atomic group forming an unsubstituted or substituted pyridine or quinoline ring together with nitrogen and carbon atoms represented in formula (I);

Y_2 represents an atomic group forming an unsubstituted or substituted heterocyclic ring, together with carbon and nitrogen atoms represented in formula (I);

X_2 represents an anion; and

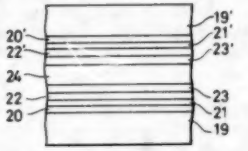
n_1 represents 0 or 1.

4,637,976

INFORMATION RECORDING MEMBER

Motoyasu Terao, Hinodemachi; Yasushi Miyauchi, Hachioji; Kazuo Shigematsu, Saitama, and Shinkichi Horigome, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,260
Claims priority, application Japan, Aug. 19, 1983, 58-150148
Int. Cl.[4] G03C 1/72, 1/76
U.S. Cl. 430—523 3 Claims



1. An information recording member comprising a substrate,

an information recording film which is formed on the substrate either directly or via at least one of inorganic and organic protective layers and which causes the change of atomic arrangement upon being irradiated by a recording beam, said information recording film having an average composition, in a direction of the film thickness, expressed by the following formula:

$$M_xTe_ySe_zO_\alpha$$

wherein x, y, z and α are values within the ranges of $2 \leqq x \leqq 40$, $30 \leqq y \leqq 95$, $3 \leqq z \leqq 45$ and $0 \leqq \alpha \leqq 20$, and M is at least one element selected from the group consisting of As, Sb, Bi, S, Si, Ge, Sn, Pb, Al, Ga, In, Ti, Zn, Cd, Au, Ag, Cu, Ni, Pd, Rh, Cr, Mo, W and Ta; a protective film positioned on at least one side of said information recording film having a composition comprised of GeO_2 or Al_2O_3.

4,637,977

METHOD OF DETERMINING DTK ISOENZYME ACTIVITY AND THE USE THEREOF

Jan S. Gronowitz, Pettbols skola, Pl 2670, S-740 73 Hargshamn, and Clas F. R. Källander, Vallby Husbyborg, S-755 90 Uppsala, both of Sweden

PCT No. PCT/SE83/00190, § 371 Date Jan. 5, 1984, § 102(e) Date Jan. 5, 1984, PCT Pub. No. WO83/04054, PCT Pub. Date Nov. 24, 1983

PCT Filed May 10, 1983, Ser. No. 576,375

Claims priority, application Sweden, May 14, 1982, 8203041

Int. Cl.[4] C12Q *1/48*

U.S. Cl. 435—15 **8 Claims**

1. A method of determining dTk isoenzyme levels of a human or animal body fluid or cell sample, comprising the steps of reacting said sample with a substrate for said isoenzyme consisting of 2'-deoxy-5-halouridin, containing a radiolabelled 5-halogen, said substrate being present in a concentration ranging from 2×10^{-9} to 5×10^{-6}M, in the presence of a phosphate donor in a concentration sufficient for producing a measurable amount of phosphorylated product, said concentration not exceeding 20 mM and a buffer system sufficient for maintaining a pH within the range of 5 to 9 in a concentration of no more than 250 mM, and measuring the amount of phosphorylated product formed on said substrate, said amount being proportional to isoenzyme level.

4,637,978

ASSAY FOR ANALYSIS OF WHOLE BLOOD

Glen M. Dappen, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,694

Int. Cl.[4] C12Q *1/60, 1/54, 1/26, 1/28*

U.S. Cl. 435—11 **30 Claims**

1. A method for the determination of an analyte other than hemoglobin in whole blood comprising the steps of:

(A) physically contacting a sample of whole blood containing an analyte other than hemoglobin and a multizone element, said element consisting essentially of support having thereon, in order and in fluid contact, a registration zone and a reagent/spreading zone,

provided said element does not contain a radiation-blocking zone,

said reagent/spreading zone having a void volume and average pore size effective to accommodate whole blood, an containing an interactive composition capable of providing, upon interaction with said analyte, a dye which can be spectrophotometrically detected at a wavelength greater than about 600 nm; and

(B) detecting said dye at a wavelength greater than about 600 nm.

4,637,979

COMPOSITION AND TEST DEVICE FOR DETERMINING THE PRESENCE OF LEUKOCYTES CONTAINING A ZWITTERION COUPLING AGENT

A. Christopher Skjold, Elkhart, Ind.; Herbert Hugl, Bergisch-Gladbach, and Gerhard Wolfrum, Leverkusen, both of Fed. Rep. of Germany, assignors to Miles Laboratories, Inc., Elkhart, Ind.

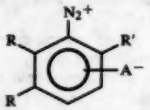
Filed Apr. 6, 1984, Ser. No. 597,611

Int. Cl.[4] C12Q *1/00, 1/38;* G01N *33/48, 1/48*

U.S. Cl. 435—19 **15 Claims**

1. A composition for determining the presence of an analyte selected from leukocytes, esterase and protease in a test sample, the composition comprising

an ester composed of aromatic phenol or pseudoaromatic phenol and an acid capable of being catalytically hydrolyzed in the presence of leukocytes, esterase or protease to yield phenol which can couple with a diazo zwitterion, and a diazonium salt having the structure



in which A^- is an anion, and R same or different is H, lower alkyl, aryl, or both of R together form a fused ring system, and in which R' is H, OH or lower alkyl.

4,637,980

EXTERNALIZATION OF PRODUCTS OF BACTERIA

Jeffrey I. Auerbach, King of Prussia, and Martin Rosenberg, Malvern, both of Pa., assignors to SmithKline Beckman Corporation, Pa.

Filed Aug. 9, 1983, Ser. No. 521,517

Int. Cl.[4] C07H *15/12;* C12P *21/00;* C12N *15/00, 1/00, 1/20*

U.S. Cl. 435—68 **31 Claims**

1. A method of producing a gene product which comprises (i) culturing a temperature sensitive bacteria, which bacteria:

(a) expresses the gene product intracellularly,

(b) is a lysogen defective in excision and replication functions and

(c) contains within the prophage DNA sequence a temperature sensitive phage repressor gene and functional phage lysozyme-encoding genes, under permissive conditions such that the gene product is expressed intracellularly and the lysozyme-encoding genes are repressed and then (ii) raising the temperature to produce restrictive conditions such that the lysozyme-encoding genes are expressed.

4,637,981

ANTIBIOTIC A-4696 FACTOR G

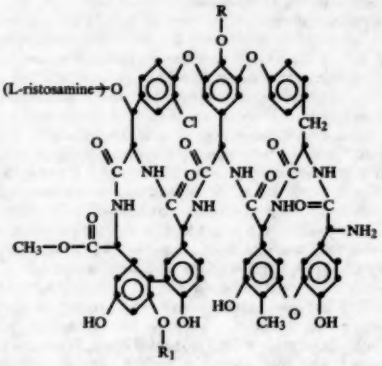
Charles L. Hershberger, New Palestine; Kurt E. Merkel, Mooresville; Robert E. Weeks, and Gene M. Wild, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 426,493, Sep. 29, 1982, Pat. No. 4,461,723, which is a continuation-in-part of Ser. No. 217,960, Dec. 18, 1980, abandoned. This application Mar. 26, 1984, Ser. No. 593,015

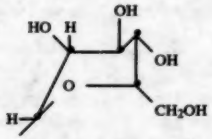
Int. Cl.[4] C12P *19/60, 19/56;* C12N *1/20;* C12R *1/045*

U.S. Cl. 435—75 **2 Claims**

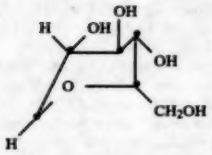
1. The method of producing the antibiotic A4696G of the formula



wherein R is



and R_1 is



which comprises cultivating the organism *Actinoplanes missouriensis* ATCC 31681 in an aqueous nutrient culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a recoverable amount of antibiotic A4696G is produced by said organism in said culture medium.

4,637,982

PROCESS FOR BIOLOGICAL PREPARATION OF AMIDES

Hideaki Yamada, 19-1, Kinomoto-Cho, Matsugasaki, Sakyo-Ku, Kyoto-Shi, Kyoto-Fu, and Yoshiki Tani, Kyoto, both of Japan, assignors to Hideaki Yamada, Kyoto and Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo, both of, Japan, a part interest

PCT No. PCT/JP82/00393, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01784, PCT Pub. Date May 26, 1983

PCT Filed Sep. 29, 1982, Ser. No. 527,579

Claims priority, application Japan, Nov. 18, 1981, 56-184688

Int. Cl.⁴ C12P *13/02, 1/04;* **C12N** *9/78;* **C12R** *1/38*

U.S. Cl. 435—129 **21 Claims**

1. A process for hydrating a nitrile having 2–4 carbon atoms to the corresponding amide which comprises contacting a nitrile with a microorganism of the genus Pseudomonas which produces nitrile hydratase.

14. A process for hydrating a nitrile having 2–4 carbon atoms to the corresponding amide which comprises contacting a nitrile with nitrile hydratase produced by a microorganism of the genus Pseudomonas.

4,637,983

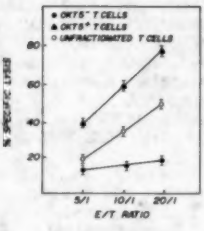
HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO HUMAN CYTOTOXIC AND SUPPRESSOR T CELLS, ANTIBODY, AND METHODS

Patric C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 82,515, Oct. 9, 1979, Pat. No. 4,364,932. This application Oct. 4, 1982, Ser. No. 432,455

Int. Cl.⁴ C12N *5/00, 15/00;* **C12P** *21/00;* **C12R** *1/91*

U.S. Cl. 435—240 **1 Claim**



1. A hybridoma having the identifying characteristics of ATCC CRL 8016.

4,637,984

MONOCLONAL ANTI-ORNITHINE DECARBOXYLASE ANTIBODY AND METHOD OF PRODUCING SAME

Thomas G. O'Brien, Drexel Hill; Anthony E. Pegg, Hummelstown, and Meehard Herlyn, Wynnewood, all of Pa., assignors to Wistar Institute of Anatomy and Biology, Philadelphia, Pa. and Research Corporation, Tuscon, Ariz., a part interest

Filed Oct. 11, 1983, Ser. No. 540,675

Int. Cl.⁴ C12N *5/00;* **C07K** *15/04*

U.S. Cl. 435—240 **8 Claims**

1. A continuous cell line which produces a monoclonal antibody of the IgM type which specifically binds to rodent ornithine decarboxylase antigen comprising a fused cell hybrid of rodent spleen cells immunized with rodent ornithine decarboxylase antigen, and rodent myeloma cells.

7. A rodent IgM monoclonal antibody, which binds to rodent ornithine decarboxylase, produced by a continuous cell line comprising a fused hybrid of rodent spleen cells immunized with rodent ornithine decarboxylase antigen, and rodent myeloma cells.

4,637,985

ASSAY PROCESSES AND MATERIALS THEREFOR

Ahmad M. Sidki, and David S. Smith, both of London, England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Sep. 27, 1983, Ser. No. 536,238

Claims priority, application United Kingdom, Sep. 27, 1982, 8227536

Int. Cl.⁴ G01N *33/542, 33/544, 33/553*

U.S. Cl. 436—518 **6 Claims**

1. In a process of carrying out a specific binding assay, for the qualitative detection or quantitative or semi-quantitative determination of an analyte which forms a component of a specific binding reaction, using a labelled conjugate form of a derivative or analogue of one of the relevant specific binding partners, said labelled form being capable of emitting delayed luminescence upon photo-excitation, the improvement which comprises using, as the labelled conjugate form of one of the relevant specific binding partners, a derivative or analogue of the specific binding partner with a derivative of a luminescent substance which shows a delayed light emission upon photoexcitation, the delayed light emission of which is subject to

quenching by molecular oxygen, and carrying out the assay using a time-resolved photometric method in the presence of an effective amount of a quench-inhibiting substance able to prevent quenching by molecular oxygen, said quench inhibiting substance comprising sodium sulphite, bisulphite or metabisulphite present in the assay reaction mixture at a concentration of the order of 10–2M and the luminescent substance being selected from derivatives of brominated and iodinated fluorophors, and fluorescent coumarins and flavones, and their brominated and iodinated derivatives.

4,637,986

FLOW CYTOMETRY LYSING REAGENT WITH LEUKOPROTECTIVE AGENT FOR PRODUCING A 3-PART WBC COUNT

Michael C. Brown, Wayland, and Stefan J. Kirchanski, Framingham, both of Mass., assignors to Ortho Diagnostic Systems, Inc., Raritan, N.J.

Filed Aug. 22, 1983, Ser. No. 525,575
Int. Cl.[4] G01N *31/00*
U.S. Cl. 436—10 **4 Claims**

1. A lysing reagent for use in a flow cytometry instrument comprising: a combination of an organic, nitrogen containing buffer selected from the group consisting of TRIS and 2-amino-2-methyl-1,3-propanediol, and an ethane sulfonic acid buffer selected from the group consisting of HEPES and TAPS; and a leucoprotective agent selected from the group consisting of methyoxyethanol at a concentration of 100–700 mM, ethoxyethanol or methoxyethoxyethanol at a concentration of 50–500 mM, butoxyethanol or ethoxyethoxyethanol or butoxyethoxyethanol at a concentration of 10–300 mM.

4,637,987

GAS MONITORING DEVICE AND METHOD

Karl Minten, La Hoya, Calif., and William Krug, Hoffman Estates, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 7, 1984, Ser. No. 607,514
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] G01N *27/00, 31/00*
U.S. Cl. 436—151 **25 Claims**

13. A method of monitoring the partial pressure of at least one gas the steps which comprise; disposing a coating of a manganese tertiary phosphine polymer complex film on a piezolelectric crystal; disposing said crystal in a defined enclosed area in which the gas is to be contained; passing the gas through said area; attaching said piezoelectric crystal to measurement means whereby changes in frequency of the piezoelectric device can be recorded.

4,637,988

FLUORESCENT LABELS FOR IMMUNOASSAY

Jerald C. Hinshaw, Ogden, Utah; John L. Toner, Webster, and George A. Reynolds, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 279,398, Jul. 1, 1981, abandoned. This application Feb. 3, 1986, Ser. No. 825,693
Int. Cl.[4] G01N *21/64*
U.S. Cl. 436—546 **30 Claims**

28. In a method for performing an immunoassay comprising the steps of

(a) fluorescently labeling a ligand of interest, a derivative of said ligand or some other molecular entity, to produce a fluorescently labeled immunologically binding ligand analog of said ligand of interest;

(b) adding a known amount of said fluorescently labeled ligand analog and an unknown amount of ligand to be assayed to a receptor which is capable of binding with said fluorescently labeled ligand analog and also is capable of binding with said ligand to be assayed; and

(c) determining the unknown amount of said ligand to be assayed by measuring the fluorescence of said fluorescently labeled ligand analog bound to said receptor or by measuring the fluorescence of said fluorescently labeled ligand analog remaining unbound,

the improvement wherein the labeled ligand analog comprises ligand adsorbed or covalently bound to a fluorescent label comprising a fluorescent chelate of a lanthanide metal and a chelating agent comprising a nucleus which is a triplet sensitizer having a triplet energy greater than that of said lanthanide metal and at least heteroatom-containing groups and a third heteroatom-containing group or heteroatom which is in or appended to the triplet sensitizer nucleus, each of said two heteroatom-containing groups appended to different carbon atoms of the triplet sensitizer nucleus, said heteroatom-containing groups forming coordinate complexes with lanthanide metals and said groups being located in said chelating agent such that they and said third heteroatom or heteroatom-containing group are capable of forming a chelate structure with the lanthanide metal, wherein each of said two heteroatom-containing groups is selected from the group consisting of nitrilodiacetate, carboxy, hydroxy, alkoxy, amino, amido, carbonyl, and mercapto, and said third heteroatom-containing group or heteroatom is selected from the group consisting of nitrogen, oxygen, sulfur, selenium, and an alkylene group of 1 to 20 carbon atoms, which alkylene group comprises or has appended thereto nitrogen, oxygen, sulfur, selenium, nitrilodiacetate, carboxy, hydroxy, alkoxy, amino, amido, carbonyl, or mercapto.

4,637,989

METHOD OF PREPARING A CERAMIC COMPOSITION

Hung C. Ling, West Windsor Township, Mercer County; Warren W. Rhodes, Raritan, and Man F. Yan, Berkeley Heights, all of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Murray Hill, both of, N.J.

Filed Mar. 29, 1985, Ser. No. 717,814
Int. Cl.[4] C04B *35/00*
U.S. Cl. 501—135 **3 Claims**

1. A method for forming a sintered ceramic composition having a peak dielectric constant of at least about 7,500 at 1 Khz represented by the formula $Pb(Zn_xMg_{1-x}Nb_2)_4O_3$ wherein x is from about 0.3 to 0.5 and being at least 90% perovskite phase material comprising the steps of:

(a) forming a columbite phase of $Zn_xMg_{1-x}Nb_2O_6$;

(b) reacting the columbite $Zn_xMg_{1-x}Nb_2O_6$ with PbO at a temperature of from greater than 800° C. for a time necessary to form the desired material.

4,637,990

HOLLOW POROUS MICROSPHERES AS SUBSTRATES AND CONTAINERS FOR CATALYSTS AND METHOD OF MAKING SAME

Leonard B. Torobin, Materials Technology Corporation, 120 Interstate North, Parkway East, Ste. 158, Atlanta, Ga. 30339

Continuation-in-part of Ser. No. 639,126, Aug. 9, 1984, and a continuation-in-part of Ser. No. 657,090, Oct. 3, 1984, said Ser. No. 639,126, is a continuation-in-part of Ser. No. 428,923, Sep. 30, 1982, Pat. No. 4,548,196, which is a continuation of Ser. No. 103,113, Dec. 13, 1979, abandoned, which is a division of Ser. No. 59,296, Jul. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 937,123, Aug. 28, 1978, abandoned, and Ser. No. 944,643, Sep. 21, 1978, abandoned. This application Mar. 14, 1985, Ser. No. 711,951
Int. Cl.[4] B01J *35/00, 37/00*
U.S. Cl. 502—10 **54 Claims**

1. Hollow porous microsphere catalysts of substantially uniform diameter of 200 to 10,000 microns and of substantially uniform wall thickness of 1.0 to 1000 microns, the walls of said microspheres comprise sintered together particles which define interconnecting voids within the walls and a single central cavity in the interior of the microspheres and inner and outer microsphere wall surfaces, said interconnecting voids are continuous and extend from the outer wall surface to the inner

wall surface, said walls have substantially uniform void content and said interconnecting voids are substantially uniformly distributed in the walls of the hollow microspheres, said walls include entrance means through which catalyst can be introduced into the interconnecting voids and into the single central cavity of the microspheres, said microspheres have catalyst on the particles forming the walls or have catalyst contained within the single central cavity or have catalyst on the particles forming the walls and have catalyst contained within the single central cavity, and the walls of said microspheres are free of latent solid or liquid blowing gas materials and are substantially free of relatively thinned wall portions or sections and bubbles.

33. A method of making hollow microsphere catalysts which comprises applying a catalyst to hollow porous microspheres of substantially uniform diameter of 200 to 10,000 microns and of substantially uniform wall thickness of 1.0 to 1000 microns, the walls of said microspheres comprise sintered together inorganic particles which define interconnecting voids within the walls and a single central cavity in the interior of the microspheres and inner and outer microsphere wall surfaces, said interconnecting voids are continuous and extend from the outer wall surfaces to the inner wall surfaces, said walls have substantially uniform void content and said interconnecting voids are substantially uniformly distributed in the walls of the hollow microspheres, said walls include entrance means through which catalysts can be introduced into the interconnecting voids and into the single central cavity of the microspheres, and the walls of said microspheres are free of latent solid or liquid blowing gas materials and are substantially free of relatively thinned wall portions or sections and bubbles, and said catalyst is applied to the particles forming the walls of the microspheres, is placed within the single central cavity of the microspheres or is applied to the particles forming the walls and is placed within the single central cavity of the microspheres.

4,637,991

PILLARED INTERLAYERED CLAYS

David R. Battiste, and Jesse R. Harris, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 10, 1985, Ser. No. 742,815
Int. Cl.[4] B01J *21/16, 29/06*
U.S. Cl. 502—68 **45 Claims**

1. A method for preparing a pillared, interlayered clay product comprising:
(a) diluting an aluminum hydroxy chloride compound with water to obtain an aqueous solution containing from about 0.4 to about 10 weight percent of aluminum hydroxy chloride;
(b) maintaining said aqueous solution at a temperature in the range from about 20° C. to about 70° C. for a time sufficient to increase the surface area and pore volume of a pillared, interlayered clay product subsequently obtained by reacting smectite clay with said aqueous solution;
(c) reacting smectite clay with said aqueous solution thereby obtaining an aluminum-exchanged clay product in an aqueous liquid;
(d) separating said aluminum-exchanged clay product from said aqueous liquid;
(e) dispersing said aluminum-exchanged clay product in water;
(f) separating aluminum-exchanged clay product from said distilled water;
(g) drying said aluminum-exchanged clay product to obtain a substantially dried aluminum-exchanged clay product; and
(h) calcining said substantially dried aluminum-exchanged clay product to obtain a calcined aluminum-exchanged clay product which is a pillared, interlayered clay product.

9. A method for preparing a pillared, interlayered clay admixed with zeolite comprising:
(a) diluting an aluminum hydroxy chloride compound with water to obtain an aqueous solution containing from about 0.4 to about 10 weight percent of aluminum hydroxy chloride;
(b) maintaining said aqueous solution at a temperature in the range from about 20° C. to about 70° C. for a time sufficient to increase the surface area and pore volume of a pillared, interlayered clay product subsequently obtained by reacting smectite clay with said aqueous solution;
(c) reacting smectite clay with said aqueous solution thereby obtaining an aluminum-exchanged clay product in an aqueous liquid;
(d) separating said aluminum-exchanged clay product from said aqueous liquid;
(e) contacting said aluminum-exchanged clay product with sufficient distilled water to provide a washed aluminum-exchanged clay product;
(f) recovering washed aluminum-exchanged clay product;
(g) agitating washed aluminum-exchanged clay product with aqueous solution containing aluminum hydroxy chloride and zeolite to produce a slurry of a mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite in aqueous liquid;
(h) separating said mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite from said aqueous liquid;
(i) drying said mixture to obtain a substantially dry mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite; and
(j) calcining said mixture of aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite to obtain a calcined mixture of said aluminum-exchanged clay product and aluminum hydroxy chloride treated zeolite which is a pillared, interlayered clay product.

13. A method for preparing a promoted pillared clay catalyst comprising:
(a) contacting a pillared, interlayered clay product prepared by the method of claim 1 with an impregnating solution of catalytically active compound or mixture of compounds for a time sufficient to impregnate said pillared, interlayered clay product with a catalytic amount of said catalytically active compound or mixture of compounds and
(b) recovering impregnated pillared, interlayered clay product from said impregnating solution.

23. A pillared, interlayered clay product prepared by the method of claim 1.

31. A pillared, interlayered clay admixed with zeolite prepared by the method of claim 9.

4,637,992

INTERCALATED CLAY COMPOSITIONS

Robert M. Lewis, Sugarland, Tex., and Rutger A. Van Santen, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 17, 1984, Ser. No. 682,732
Int. Cl.[4] B01J *21/16*
U.S. Cl. 502—84 **7 Claims**

1. A clay composition comprising colloidal inorganic oxide particles intercalated between the swellable layers of said clay wherein said clay layers are separated by a distance of at least 16 angstrom.

2. A process for preparing a clay composition having inorganic oxide particles intercalated between the swellable layers of said clay which process comprises:
a. contacting a swellable layered clay with a solution of colloidal inorganic oxide particles, said particles having net positive surface charges,
b. separating the intercalated clay from the solution and,
c. drying said intercalated clay.

4,637,993

PROCESS FOR PREPARATION OF CATALYST

Willibrord A. van Erp; Johannes M. Nanne, and Martin F. M. Post, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 25, 1985, Ser. No. 780,066

Claims priority, application Netherlands, Oct. 4, 1984, 8403021

Int. Cl.[4] B01J *21/06, 21/08, 23/74*

U.S. Cl. 502—242 4 Claims

1. A process for the preparation of catalysts comprising cobalt and a zirconium promoter supported on a silica carrier, wherein the cobalt is distributed over the carrier in such a manner as to satisfy the relation $(\Sigma V_p/\Sigma V_c) \leqq 0.55$, where ΣV_c represents the total volume of the catalysts particles under consideration and ΣV_p is found by adding up the peel volumes present in the catalyst particles, the latter being regarded as being composed of a kernel surrounded by a peel, which kernel is of such a shape that at every point of the kernel perimeter the shortest distance (d) to the perimeter of the peel is the same, d being equal for all catalyst particles under consideration, and having been chosen such that the quantity of cobalt present in ΣV_p is 90% of the quantity of cobalt present in ΣV_c, which process comprises immersing a porous carrier once or several times in a solution of a cobalt compound, removing the liquid from the composition after each immersion and finally calcining and activating the composition, that during each immersion the following relation between the viscosity measured at 60° C. (v in cS) and the temperature (T in °K.) of the solution, and the immersion time (t in s) is satisfied: $(\log v/t \times T) \times 10^4 \geqq 1$.

4,637,994

ADSORBENT AND PROCESS FOR PREPARING THE SAME

Nobutaka Tani, Minoo, and Tsuneo Hayashi, Ashiya, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 557,061, Dec. 1, 1983, Pat. No. 4,576,928. This application May 28, 1985, Ser. No. 737,880

Claims priority, application Japan, Dec. 2, 1982, 57-212379; Feb. 25, 1983, 58-31194; Apr. 18, 1983, 58-68116; Apr. 21, 1983, 58-70967; Oct. 5, 1983, 58-187365

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] B01J *20/22*

U.S. Cl. 502—404 19 Claims

1. An adsorbent for removing low and/or very low density lipoprotein from body fluid in extracorporeal circulation treatment, which comprises a water-insoluble porous hard gel with exclusion limit of 10^6 to 10^9 daltons on which a sulfated compound is immobilized by a covalent linkage; said sulfated compound being a compound obtained by sulfation of a hydroxy-containing compound.

4,637,995

PREPARATION OF MONOLITHIC CATALYST SUPPORTS HAVING AN INTEGRATED HIGH SURFACE AREA PHASE

Thomas P. DeAngelis, Horseheads, and Irwin M. Lachman, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,885

Int. Cl.[4] B01J *20/28, 35/00*

U.S. Cl. 502—439 25 Claims

1. A method of preparing a monolithic catalyst support which comprises:

(a) providing a substantially homogeneous body comprising an admixture of

(i) a first phase sinterable ceramic matrix material, in particulate form finer than 200 mesh, selected from the group consisting of cordierite, mullite, alpha-alumina, lithium aluminosilicate, and mixtures of these, and

(ii) a second phase high surface area catalyst-support material having a crystalline size no larger than 0.2 microns and a surface area of at least 40 m^2/g, said catalyst-support material consisting of transition metal sulfide; a mixture of transition metal sulfides; porous oxide selected from the group consisting of alumina, zirconia, spinel, silica, zeolite, titania, and mixtures of these; or a mixture of said sulfide and said oxide materials;

(b) forming the resultant body into a desired shape; and

(c) heating the shaped body at a temperature sufficient to sinter the first phase matrix material.

17. A monlithic catalyst support comprising 50-90 parts by weight of a sintered ceramic matrix material and 10-50 parts per weight of a high surface area catalyst-support material dispersed throughout the matrix wherein

(a) the ceramic matrix material consists of cordierite, mullite, alpha-alumina, lithium aluminosilicate, or mixtures of these; and

(b) the dispersed catalyst-support material has a surface area of at least 40 m^2/g and a crystallite size no larger than about 0.5 microns, and the catalyst-support material consists of transition metal sulfide; a mixture of transition metal sulfides; porous oxide selected from the group consisting of alumina, zirconia, spinel, silica, zeolite, titania, and mixtures of these; or a mixture of said sulfide and said oxide materials.

4,637,996

ANTIULCER COMPOSITION CONTAINING A DIPEPTIDE COMPOUND

Jin-emon Konishi, Musashino, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 24, 1985, Ser. No. 737,420

Claims priority, application Japan, May 24, 1984, 59-105098

Int. Cl.[4] A61K *37/43*

U.S. Cl. 514—11 5 Claims

1. A method for the treatment of ulcers in mammals which comprises administering to such a mammal an effective amount of a dipeptide as the active substance selected from the group consisting of Gly-Ser, Ser-His, His-Lys and cyclic His-Lys, or a pharmaceutically acceptable salt thereof.

4,637,997

HEXAPEPTIDE, PROCESS FOR OBTAINING II AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING II

Pierre Jolles, Paris; Danièle Migliore-Samour, Le Kremlin-Bicêtre; Fabienne Parker, St. Maur des Fosses, all of France, and Monika Casaretto, Monchen-Gladbach, Fed. Rep. of Germany, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed Feb. 4, 1985, Ser. No. 697,903

Claims priority, application France, Feb. 7, 1984, 84 01816

Int. Cl.[4] A61K *37/43;* C07K *7/06*

U.S. Cl. 514—17 3 Claims

1. The hexapeptide of formula

Val-Glu-Pro-Ile-Pro-Tyr

in which the amino acids are in L form.

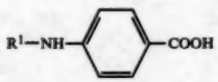
4,637,998

PHARMACEUTICAL COMPOSITION CONTAINING A DERIVATIVE OF PARA-AMINOBENZOIC ACID AS AN ACTIVE INGREDIENT

Chikao Yoshikumi, Kunitachi; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga, Shinjuku; Takayoshi Fujii, Adachi; Minoru Ohhara, Itabashi, and Takao Ando, Setagaya, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 81,190, Oct. 2, 1979, Pat. No. 4,322,408, which is a continuation-in-part of Ser. No. 24,095, Mar. 26, 1979, abandoned. This application Aug. 20, 1981, Ser. No. 294,574
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—42 16 Claims

1. A pharmaceutical composition in dosage unit form which comprises a dosage effective for the treatment of hyperglycemia, hypertension, hyperlipemia, inflammatory disease, pains due to the accentuation of central nerve and pyrexia due to accentuation of central nerve of a compound of the formula:



wherein R^1 denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, glucose and galactose, or a pharmaceutically acceptable salt thereof; and a carrier or a diluent therefor.

8. A method for the treatment of hyperglycemia, which comprises administering to an animal suffering from hyperglycemia, and effective amount of a compound of the formula:

wherein R^1 denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, glucose, galactose and mannose, or a pharmaceutically acceptable salt thereof.

4,637,999

SUBSTITUTED CEPHALOSPORINS AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

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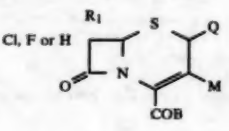
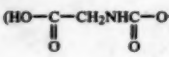
Filed May 2, 1983, Ser. No. 490,617
Int. Cl.[4] C07D *501/20*; A61K *31/545*
U.S. Cl. 514—201 8 Claims

1. A pharmaceutical composition for treating elastase-mediated conditions in a mammalian species comprising a non-toxic pharmaceutical carrier and an effective amount of a compound of structural formula:



(I)

wherein
M is:
(1) trifluoromethyl;
(2) chloro or fluoro;
(3) —COOH;
(4) —CHO;
(5) tosyloxy; or
(6) —CH_2A wherein A represents
(a) hydrogen;
(b) halo;
(c) hydroxy;
(d) C_{1-6}alkoxy;
(e) phenyloxy;
(f) phenyl C_{1-6}alkoxy;
(g) unsubstituted or substituted mercapto of formula SR_5 wherein R_5 is H, C_{1-6}alkyl, phenyl, benzyl, C_{1-6}alkenyl,
(h) —SCOR, —SCOOR or SCSOR wherein R is H or C_{1-6}alkyl;
(i) C_{1-6}alkanoyloxy, benzylcarboxyloxy or phenylcarbonyloxy;
(j) a substituted or unsubstituted amino or amido group selected from a group consisting of —NH_2, —CONHR, —$CON(R)_2$, —NHR, and —$N(R)_2$;
(k) 3-(hydroxycarbonyl)propanoyloxy;
(l) hydroxycarbonylmethylaminocarbonyloxy



R_1 is
(a) hydrogen;
(b) OR'_1 wherein R'_1 is C_{1-6}alkyl, phenyl or phenyl C_{1-6}alkyl;

where R represents H, C_{1-6}alkyl, phenyl, benzyl, or C_{1-6}alkylamino;
(c) C_{1-6}alkyl, phenyl or phenyl C_{1-6}alkyl;
(d) halo;
B is OB_1 or NB_2B_3 wherein B_1 and B_2 independently are:
(a) straight or branched chain alkyl having from 1 to 6 carbon atoms;
(b) phenyl;
(c) cycloalkyl having from 3 to 8 carbon atoms;
(d) alkenyl having from 2 to 8 carbon atoms;
(e) cycloalkenyl having from 5 to 8 carbon atoms;
(f) alkynyl having from 2 to 8 carbon atoms;
(g) alkoxy alkyl having from 2 to 10 carbon atoms;
(h) phenyl C_{1-6}alkyl or C_{1-6}alkylphenyl;
(i) C_{2-8}alkenylalkyl;
(j) C_{2-8}alkanoylalkyl;
(k) C_{2-8}alkanoyloxyalkyl;
(l) C_{1-6}alkoxycarboxylC_{1-6}alkyl;
the above groups (a)–(l) being unsubstituted or substituted by radicals such as alkyl, hydroxy, alkoxy, halo, nitro, mercapto, amino, substituted mono or diC_{1-6}alkyl amino, cyano, carboxy, —SO_2NH_2, carbamoyl, carbamoyloxy, alkylsulfonyl, alkylsulfinyl, sulfamoyl, azido, carboxamido or N-substituted carboxamido;
B_3 is B_1 or hydrogen; and
Q is
(1) hydrogen;
(2) C_{1-6}alkyl;
(3) haloC_{1-6}alkyl;
(4) hydroxy C_{1-6}alkyl;
(5) C_{1-6}alkyl methylene, phenylmethylene, or phenylthiomethylene;
(6) C_{1-6}alkoxy C_{1-6}alkyl;
(7) benzyl;

(8) phenylthio C_{1-6}alkyl, phenylsulfinyl C_{1-6}alkyl or phenylsulfonyl C_{1-6}alkyl;
(9) phenoxy C_{1-6}alkyl; or
(10) phenylamino C_{1-6}alkyl.

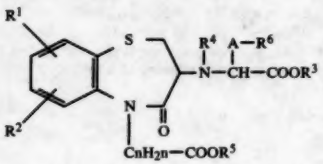
4,638,000

CONDENSED SEVEN-MEMBERED RING COMPOUNDS, THEIR PRODUCTION AND USE

Hirosada Sugihara, Osaka; Kohei Nishikawa, Kyoto, and Katsumi Ito, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

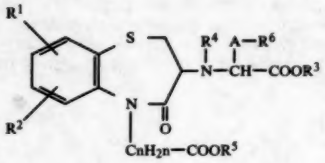
Continuation-in-part of Ser. No. 637,620, Aug. 3, 1984, Pat. No. 4,548,932. This application Jan. 14, 1985, Ser. No. 691,005
Claims priority, application PCT Int'l Appl., Mar. 22, 1984, PCT/JP84/00119; Apr. 6, 1984, PCT/JP84/00172; Jul. 13, 1984, PCT/JP84/00363
Int. Cl.[4] A61K *31/55*; C07D *417/12*
U.S. Cl. 514—211 **27 Claims**

1. A compound of the formula:



wherein
R^1 and R^2 are independently hydrogen, halogen, trifluoromethyl, C_{1-4} alkyl or C_{1-4} alkoxy, or both jointly form tri- or tetramethylene,
R^3 and R^5 are independently hydrogen, C_{1-4} alkyl or phenyl-C_{1-4} alkyl,
R^4 is hydrogen or C_{1-4} alkyl,
R^6 is oxetanyl, thietanyl, azetidinyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, oxanyl, thianyl, piperidyl, oxepanyl, thiepanyl, perhydroazeipinyl, oxocanyl, thiocanyl, perhydroazocinyl, dioxanyl, dithianyl, piperazinyl, morpholinyl, perhydrothiazinyl, oxathianyl, perhydrodiazepinyl, oxathiepanyl, dioxepanyl, dithiepanyl, perhydrooxazepinyl, perhydrothiazepinyl, perhydrooxazocinyl, perhydrothiazocinyl, oxathiocanyl, perhydrodiazocinyl, dithiocanyl, dioxocanyl, chromanyl, isochromanyl, 3,4-dihydro-2H-1-thianaphthyl, 3,4-dihydro-1H-2-thianaphthyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, 2,3-dihydrobenzofuryl, 1,3-dihydroisobenzofuryl, 2,3-dihydrobenzothienyl, 1,3-dihydrobenzothienyl, indolinyl, isoindolinyl, 2,3,4,5-tetrahydro-1(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-3(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-2(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-1-benzoxepinyl, 1,3,4,5-tetrahydro-2-benzoxepinyl, 1,2,4,5-tetrahydro-3-bemzoxepinyl, 2,3,4,5-tetrahydro-1-benzothiapinyl, 1,3,4,5-tetrahydro-2-benzothiepinyl, 1,2,4,5-tetrahydro-3-benzothiepinyl, 2,3-dihydro-1,4-benzodioxinyl 2,3-dihydro-1,4-dithianaphthyl, 1,2,3,4-tetrahydroquinoxalinyl, 3,4-dihydro-2H-1,4 benzoxadinyl, 3,4-dihydro-2H-1,4-benzothiadinyl, 2,3-dihydro-1,4-benzoxathienyl, 3,4-dihydro-2H-1,5-benzoxepanyl, 2,3-dihydro-5H-1,4-benzodioxepinyl, 2,3,4,5-tetrahydro-1H-1,5-benzodiazepinyl, 2,3,4,5-tetrahydro-1H-1,4-benzodiazepinyl, 3,4-dihydro-2H-1,5-benzodithiepinyl, 2,3-dihydro-5H-1,4-benzodithiepinyl, perhydroindolyl, perhydroisoindolyl, perhydroquinolyl, perhydroisoquinolyl, perhydro-1-thianaphthyl or perhydro-2-thianaphthyl, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, oxo, C_{1-5} alkanoyl, benzoyl, phenyl-C_{1-4} alkoxycarbonyl or C_{1-4} alkoxycarbonyl,
A is C_{1-16} alkylene and
the group CnH_{2n} represents methylene, ethylene or ethylidene,
or a pharmaceutically acceptable salt thereof.

27. A method for prevention or treatment of hypertension in a mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of the formula:



wherein
R^1 and R^2 are independently hydrogen, halogen, trifluoromethyl, C_{1-4} alkyl or C_{1-4} alkoxy, or both jointly from tri- or tetramethylene,
R^3 and R^5 are independently hydrogen, C_{1-4} alkyl or phenyl-C_{1-4} alkyl,
R^4 is hydrogen or C_{1-4} alkyl,
R^6 is oxetanyl, thietanyl, azetidinyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, oxanyl, thianyl, piperidyl, oxepanyl, thiepanyl, perhydroazepinyl, oxocanyl, thiocanyl, perhydroazocinyl, dioxanyl, dithianyl, piperazinyl, morpholinyl, perhydrothiazinyl, oxathianyl, perhydrodiazepinyl, oxathiepanyl, dioxepanyl, dithiepanyl, perhydrooxazepinyl, perhydrothiazepinyl, perhydrooxazocinyl, perhydrothiazocinyl, oxathiocanyl, perhydrodiazocinyl, dithiocanyl, dioxocanyl, chromanyl, isochormanyl, 3,4-dihydro-2H-1-thianaphthyl, 3,4-dihydro-1H-2-thianaphthyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, 2,3-dihydrobenzofuryl, 1,3-dihydroisopenzofuryl, 2,3-dihydrobenzothienyl, 1,3-dihydrobenzothienyl, indolinyl, isoindolinyl, 2,3,4,5-tetrahydro-1(1H)-benzoazepinyl 2,3,4,5-tetrahydro-3(1H)-benzoazepinyl, 2,3,4,5-tetrahydro-2(1H)-benzoazepinyl, 2,3,4,5-ietrahydro-1-benzoxepinyl, 1,3,4,5-tetrahydro-2benzoxepinyl, 1,2,4,5-tetrahydro-3-benzoxepinyl, 2,3,4,5-tetrahydro-1-benzothiepinyl, 1,3,4,5-tetrahydro-2-benzothiepinyl, 1,2,4,5-tetrahydro-3-benzothiepinyl, 2,3-dihydro-1,4-benzodioxinyl, 2,3-dihydro-1,4-dithianaphthyl, 1,2,3,4-tetrahydroquinoxalinyl, 3,4-dihydro-2H-1,4-benzoxadinyl, 3,4-dihydro-2H-1,4-benzothiadinyl, 2,3-dihydro-1,4-benzoxathienyl, 3,4-dihydro-2H-1,5-benzoxepanyl, 2,3-dihydro-5H-1,4benzodioxepinyl, 2,3,4,5-tetrahydro-1H-1,5-benzodiazepinyl, 2,3,4,5-tetrahydro-1H-1,4-benzodiazepinyl, 3,4-dihydro-2H-1,5-benzodithiepinyl, 2,3-dihydro 5H-1,4-benzodithiepinyl, perhydroindolyl, perhydroisoindolyl, perhydroquinolyl, perhydroisoquinolyl, perhydro-1-thianaphthyl or perhydro-2-thianaphthyl, each of said groups being unsubstituted or substituted by C_{1-4} alkyl, oxo, C_{1-5} alkanoyl, benzoyl, phenyl-C_{1-4} alkoxycarbonyl or C_{1-4} alkoxycarbonyl,
A is C_{1-16} alkylene and
the group CnH_{2n} represents methylene, ethylene or ethylidene,
or a pharmaceutically acceptable salt thereof.

4,638,001

BICYCLIC BENZENOID AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

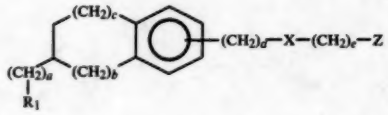
Continuation-in-part of Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This application Apr. 27, 1984, Ser. No. 604,813

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/41, 31/535;* **C07D** *249/12, 413/12*

U.S. Cl. 514—212 **21 Claims**

1. A compound of the formula:



wherein:

a is 0, 1 or 2;

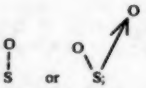
b is 0 or 1;

c is 1-b, 2-b or 3-b

d is 0 or 1;

e is 2, 3 or 4;

X is oxygen, sulfur,

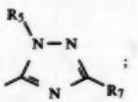


Z is —NHR_4;

R_1 is —NR_2R_3;

R_2 and R_3 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;

R_4 is



R_5 is H or lower alkyl;

R_7 is hydrogen, lower alkyl, lower alkenyl, aryl, arloweralkyl, hydroxyloweralkyl, acyloxyloweralkyl, loweralkoxyloweralkyl, aryloxyalkyl, aroyloxyalkyl, aralkyloxyalkyl, aminoalky, alkylaminoalkyl, dialkylaminoalkyl, hydroxy, alkoxy, alkylthio or halogen or NR_8R_9;

R_8 is hydrogen, loweralkyl,, lower alkenyl or arloweralkyl;

R_9 is hydrogen, COR_{10}, SO_2R_{11} or

R_{10} is hydrogen, loweralkyl, aryl, arloweralkyl, loweralkoxy, heteroaryl, or monocyclic heteroarylalkyl;

R_{11} is lower alkyl or aryl;

R_{12} is hydrogen, lower alkyl, cyclololoweralkyl, aryl or arloweralkyl; wherein any aryl is phenyl or substituted phenyl and any aroyl is benzoyl;

or a pharmaceutically acceptable salt thereof.

18. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an antisecretory effective amount of a compound according to claim 1.

4,638,002

2,3,4-TRINOR-1,5-INTER-META-PHENYLENE-PROSTACYCLIN COMPOUNDS USEFUL IN INHIBITING THROMBOCYTE AGGREGATION

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PCT No. PCT/HU83/00021, § 371 Date Dec. 30, 1983, § 102(e) Date Dec. 30, 1983, PCT Pub. No. WO83/04021, PCT Pub. Date Nov. 24, 1983

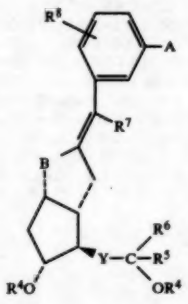
PCT Filed May 6, 1983, Ser. No. 576,399

Claims priority, application Hungary, May 6, 1982, 1421/82

Int. Cl.[4] A61K *31/44;* **C07D** *307/935*

U.S. Cl. 514—212 **6 Claims**

1. A compound of the Formula (I)



wherein

A stands for carboxy, cyano, tetrazolyl or —$COOR^3$ or —$CONR^1R^2$;

R^3 is C_{1-4} alkyl or an equivalent of a pharmacologically acceptable cation;

R^1 and R^2 each stands for hydrogen, phenyl; C_{1-5} alkyl optionally substituted by carboxy, hydroxy, phenyl or C_{2-5} alkoxycarbonyl; or C_{1-4} alkylsulfonyl; or

R^1 and R^2 together form an α,ω-alkylene chain containing 3–6 carbon atoms;

B stands for oxygen;

Y is optionally bromo-substituted vinylene or a —C≡C— group;

R^4 stands for hydrogen or tetrahydro-pyran-2-yl;

R^5 represents an alkyl group containing 5–9 carbon atoms, which can be optionally interrupted by one or more oxygen atoms or —CH=CH— or C≡C groups and/or optionally substituted by halogen; or a phenoxymethyl group optionally substituted by halogen or trifluoromethyl; or an alkenoyloxymethyl group containing 3–5 carbon atoms in the alkenoyl group;

R^6 is hydrogen or C_{1-4} alkyl;

R^7 stands for hydrogen, halogen, cyano, C_{1-4} alkyl or C_{1-4} alkoxy;

R^8 is hydrogen, halogen, cyano, nitro, hydroxy or C_{2-5} alkanoylamido;

with the proviso that if

R^5 stands for an alkyl group containing 5 to 9 carbon atoms or haloalkyl with 5 to 9 carbon atoms, or a phenoxymethyl group optionally substituted by halogen or trifluoromethyl, then either R^7 is other than hydrogen, or C_1 to C_4 alkyl, or R^8 is other than hydrogen, or A is other than carboxy or —$COOR^3$, or a salt thereof formed with a pharmaceutically acceptable cation.

6. A method of treating an animal subject in need of a prolonged cytoprotective, thrombocyte aggregation inhibiting, and a low hypotensive effect which comprises the step of administering to said animal subject a pharmaceutically effective amount of the compound of the formula (I) defined in claim 1 or a salt formed thereof with a pharmacologically acceptable cation.

4,638,003

1-(4-ALKYLTHIOPHENYL)-2-(SUBSTITUTED OR UNSUBSTITUTED PIPERAZINE-1-YL)-1,3-PROPANEDIOL, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM USEFUL AS ANTIARRHYTHMIC AND VASODILATING AGENTS

Dario Chiarino, Monza; Angelo Carenzi, Busto Arsizio; Davide Della Bella, Milan, and Mario Fantucci, Piazza Brembana, all of Italy, assignors to Zambon S.p.A., Vincenza, Italy

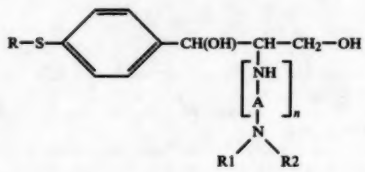
Filed Aug. 1, 1984, Ser. No. 636,714

Claims priority, application Italy, Aug. 5, 1983, 22451 A/83

Int. Cl.[4] A61K *31/495, 31/135;* **C07D** *241/04*

U.S. Cl. 514—255 **17 Claims**

1. A compound of the Formula



(I)

wherein

R is an alkyl having from 1 to 4 carbon atoms;

n is 0 or 1;

A is an alkyl having from 2 to 6 carbon atoms;

R1 is hydrogen or an alkyl having from 1 to 6 carbon atoms;

R2 is a phenoxyalkyl, a mono- or di-phenylalkyl where the alkyl has from 1 to 6 carbon atoms and the phenyl moiety can be substituted by one or two substituents, equal or different between them, which are selected from the group conprising halogen, 1–4 C alkyl and 1–4 C alkoxy, or

R1 and R2, together with the nitrogen atom to which they are linked, form a piperozinyl ring which can be substituted on one having nitrogen by a 3–6 C cycloalkyl, a 1–6 C alkyl or by a mono- or a diphenylalkyl where, in turn, the alkyl has from 1 to 6 carbon atoms and the phenyl moiety can be substituted by one or two substituents, equal or different between them, which are selected from the group consisting halogen, 1–4 C alkyl and 1–4 C alkoxy,

and pharmaceutically acceptable salts thereof with organic and inorganic pharmaceutically acceptable acids.

5. A method comprising administering to an animal in need thereof a calcium antagonist activity effective amount of a compound according to claim 1.

4,638,004

SUBSTITUTED PHENYLSULPHONYLUREAS

Jörg Stetter, Wuppertal; Heinz-Jürgen Wroblowsky, Langenfeld; Robert R. Schmidt, Bergisch-Gladbach; Hans-Joachim Santel, Cologne; Gerd Hänssler, Leverkusen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

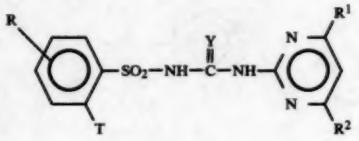
Filed May 15, 1985, Ser. No. 734,503

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420769

Int. Cl.[4] C07D *239/46;* **A01N** *43/54*

U.S. Cl. 514—272 **14 Claims**

1. A substituted phenylsulphonylurea of the formula

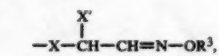


in which

R is hydrogen, fluorine, chlorine, bromine, iodine, nitro or alkyl, halogenoalkyl or alkoxy, each of which has up to 4 carbon atoms and, where relevant, up to 9 halogen atoms,

Y is oxygen or sulphur,

T is —X—CH_2—$Si(CH_3)_3$, or



R^1 and R^2 each independently is alkyl, alkoxy, or alkoxyalkyl, each having up to 6 carbon atoms in the individual alkyl parts,

X is oxygen, sulphur, the sulphinyl group or the sulphonyl group,

X' is hydrogen or alkyl having 1 to 4 carbon atoms, and

R^3 is hydrogen, or alkyl, alkenyl, alkinyl, alkoxyalkyl, alkylthioalkyl, halogenoalkyl or halogenoalkenyl, each of which has up to 6 carbon atoms in the individual alkyl or alkenyl or alkinyl parts, and, where relevant, up to 9 halogen atoms, or is aralkyl which has up to 4 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part and is optionally substituted in the aryl part by halogen, cyano, nitro, or alkyl, alkoxy or halogenoalkyl, each of which has up to 4 carbon atoms and, where relevant, up to 9 halogen atoms.

11. A method of combating fungi which comprises applying to such fungi or a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,638,005

MONOQUATERNIZED PYRAZINIUM COMPOUNDS AND THEIR USE AS ELECTRON CARRIERS IN PHOTOSYNTHETIC PROCESSES

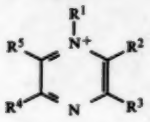
Guillermo A. Iacobucci; George A. King; Jacob H. Goldstein, all of Atlanta, Ga., and John R. Benemann, Vallejo, Calif., assignors to The Coca-Cola Company

Filed Mar. 18, 1983, Ser. No. 476,544

Int. Cl.[4] C07D *241/12, 241/18*

U.S. Cl. 544—336 **34 Claims**

1. A monoquaternized pyrazinium compound of the formula:



wherein:

R^1 is alkyl of 1 to 3 carbons, or (carboxy)alkyl of 2 to 4 carbons;

R^2, R^4 and R^5 are independently selected from hydrogen, and alkyl of 1 to 3 carbons;

R^3 is sulfonoxy or a group of the formula $(CH_2)_nCHXY$ wherein

X is hydrogen, hydroxy, carboxy, carboxamido, sulfonoxy, (sulfonoxy)alkyl of 1 to 3 carbons, (carboxy) alkyl of 2 to 4 carbons or dihydroxyalkyl of 2 to 3 carbons;

Y is hydrogen, (sulfonoxy)alkyl of 1 or 3 carbons, dihydroxyalkyl of 2 to 3 carbons or alkyl of 1 to 3 carbons; and n is a whole number from 0 to 3; or n is a whole number from 0 to 6 when either of X or Y constitutes a sulfonoxy group or a (sulfonoxy)alkyl group or when X and Y together constitute multiple polar groups;

provided that

when R^1 is alkyl, R^3 is other than alkyl; and

when R^1 and R^3 together contain other than a carboxy or sulfonoxy substituent, an anion is also present.

4,638,006

AMNESIA REVERSAL WITH N,N-DIALKYLAMINOALKYL-HEXAHYDRO-5-OXO 1H-PYRROLIZINE-3-CARBOXAMIDES

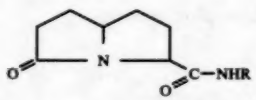
Donald E. Butler, Holland, Mich., assignor to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 24, 1985, Ser. No. 779,712

Int. Cl.[4] A61K *31/445;* **C07D** *487/04*

U.S. Cl. 514—323 **22 Claims**

1. A compound having the structural formula



wherein R is $(CH_2)_nNR'R''$ wherein n is one, two, three, or four; R' and R'' are each independently a straight or branched alkyl of from one to six carbon atoms or combined with the nitrogen to form cis- or trans-2,6-dimethyl piperidine which may optionally be substituted with one or more alkyl groups of from one to four carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

20. A cognition activating pharmaceutical composition comprising an effective amount of a compound as defined in claim 1 in combination with a pharmaceutically acceptable carrier.

4,638,007

TRIAZOLE ANTIFUNGAL AGENTS

Kenneth Richardson, and Peter J. Whittle, both of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

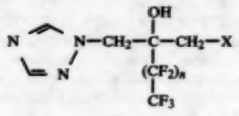
Filed Aug. 20, 1984, Ser. No. 642,301

Claims priority, application United Kingdom, Aug. 26, 1983, 8322983

Int. Cl.[4] A61K *31/41;* **C07D** *401/12, 249/08*

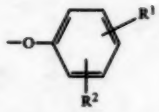
U.S. Cl. 514—340 **21 Claims**

1. A compound having the formula



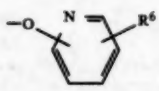
(I)

or a pharmaceutically or agriculturally acceptable salt thereof, wherein n is zero or an integer of from 1 to 4; and X is:



(a)

where R^1 and R^2 are each independently H, F, Cl, Br, I, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, —CN or $—NO_2$; or R^1 is H and R^2 is 1,2,4-triazol-1-yl;



(b)

where R^6 is H, F, Cl, Br, I, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, —CN or $—NO_2$;

$S(O)_m(C_1–C_4$ alkyl) (c)

where m is 0, 1 or 2; or

$—CONR^3R^4$ (d)

where R^3 and R^4 are each independently H or C_1–C_4 alkyl.

4,638,008

ANTIARRHYTHMIC AGENTS

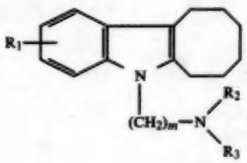
Magid A. Abou-Gharbia, Wilmington, Del.; Meier E. Freed, and Thomas J. Colatsky, both of Paoli, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 684,211, Dec. 20, 1984, Pat. No. 4,546,193. This application Jun. 3, 1985, Ser. No. 740,651

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—411 **3 Claims**

1. A method for preventing or relieving cardiac arrhythmia and coronary artery vasospasm which comprises orally or parenterally administering to an aminal in need thereof an effective amount of a compound of the formula:



in which

R_1 is $—NHCO_2R_8$ or $—NHCO_2(CH_2)_o—NR_9R_{10}$ where R_8 is alkyl of 1 to 6 carbon atoms; R_9 and R_{10} are alkyl of 2 to 6 carbon atoms and o is 1 to 6;

R_2 and R_3 are alkyl of 1 to 6 carbon atoms; and

m is one of the integers 1,2,3 or 4;

or a pharmaceutically acceptable salt thereof.

4,638,009

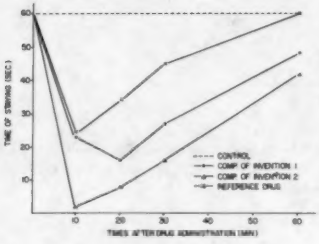
DERIVATIVES OF 3-PYRROLIDINOPROPIOPHENONE AND A PROCESS FOR PREPARATION THEREOF

Yasuo Itho, Katsuyamashi; Hideo Kato, Kentoku; Nobuo Ogawa, Katsuyamashi; Kagari Yamagishi, Katsuyamashi; Eiichi Koshinaka, Katsuyamashi, and Hiroyuki Nishino, Katsuyamashi, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi Fukui, Japan

Filed Jan. 25, 1984, Ser. No. 573,862

Int. Cl.[4] A61K *31/41*; C07D *207/06*

U.S. Cl. 514—428 **6 Claims**



1. A compound which is selected from the group consisting of 4'-ethyl-2-methyl-3-pyrrolidinopropiophenone and a pharmaceutically-acceptable acid addition salt thereof.

5. A method of relaxing muscles in a subject in need thereof comprising the step of administering an effective muscle-relaxant amount of 4'-ethyl-2-methyl-3-pyrrolidinopropiophenone or an acid-addition salt thereof to the said subject.

4,638,010

ESTER SUBSTITUTED AMINOALKANOYLUREIDO AMINO AND IMINO ACID AND ESTER COMPOUNDS

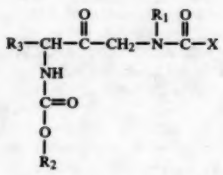
Harold N. Weller, III, and Eric M. Gordon, both of Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 707,123

Int. Cl.[4] C07D *207/04*; A61K *31/40, 31/34, 31/38*

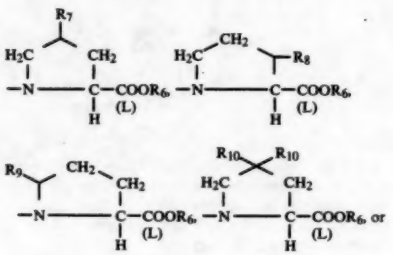
U.S. Cl. 514—423 **13 Claims**

1. A compound of the formula



including a pharmaceutically acceptable salt thereof wherein:

X is



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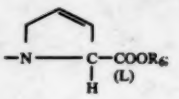
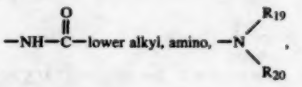
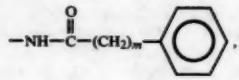
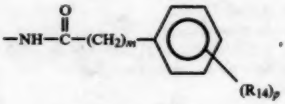
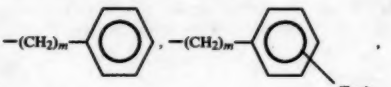


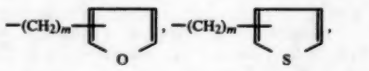
R_7 is hydrogen, lower alkyl, halogen, hydroxy,

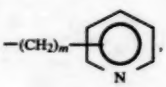




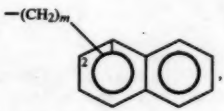




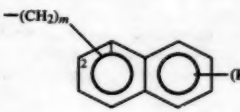


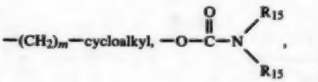


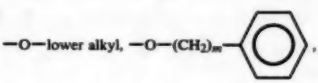
a 1- or 2-naphthyl of the formula



a substituted 1- or 2-naphthyl of the formula







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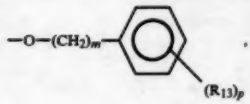
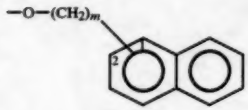
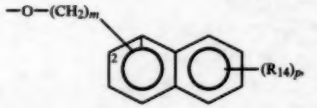
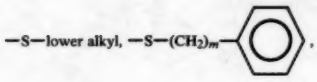


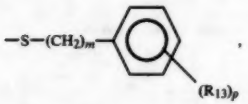
a 1- or 2-naphthyloxy of the formula



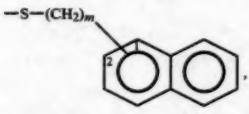
a substituted 1- or 2-naphthyloxy of the formula



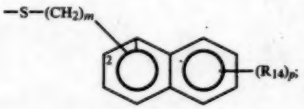




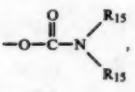
a 1- or 2-naphthylthio of the formula

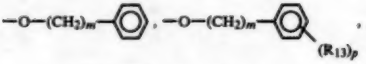


or a substituted 1- or 2-naphthylthio of the formula

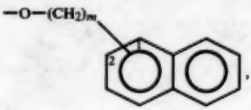


R_8 is halogen,

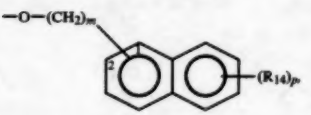


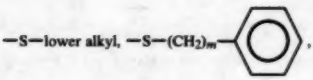


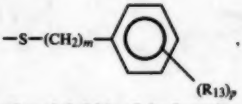
—O—lower alkyl, a 1- or 2-naphthyloxy of the formula



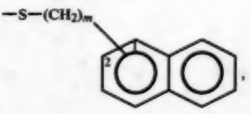
a substituted 1- or 2-naphthyloxy of the formula



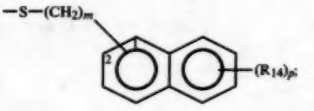




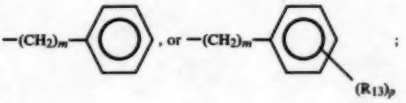
a 1- or 2-naphthylthio of the formula



or a substituted 1- or 2-naphthylthio of the formula



R_9 is keto,



R_{10} is halogen or —Y—R_{16};

R_{13} is lower alkyl of 1 to 4 carbons, lower alkoxy or 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy;

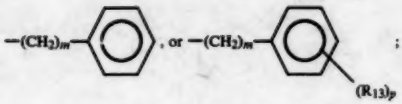
m is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is methyl, methoxy, chloro, or fluoro;

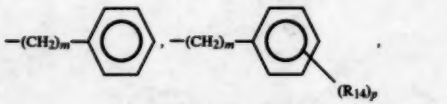
R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

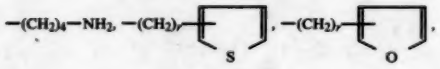
Y is oxygen or sulfur;

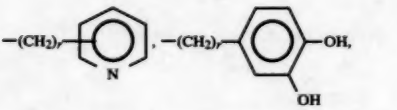
R_{16} is lower alkyl of 1 to 4 carbons

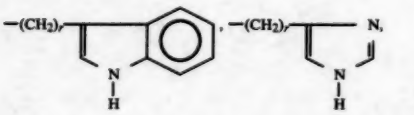


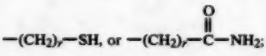
R_{19} is lower alkyl, benzyl or phenethyl;
R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;
R_1 is hydrogen, lower alkyl, halo substituted lower alkyl,



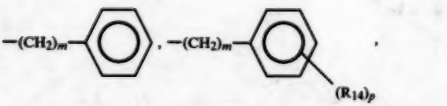


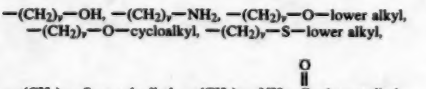


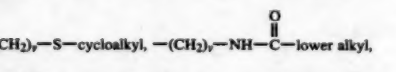


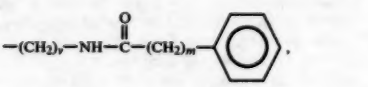


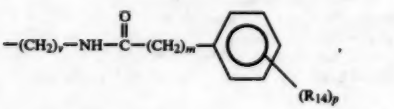
R_2 is lower alkyl, $-(CH_2)_m$—cycloalkyl,

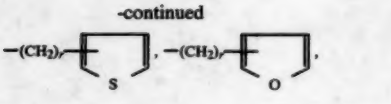


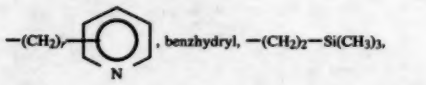


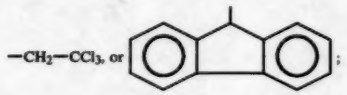




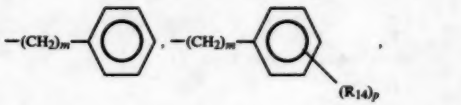


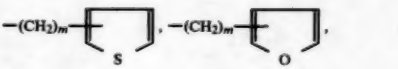


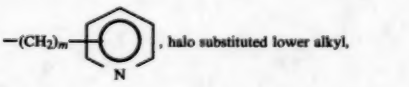


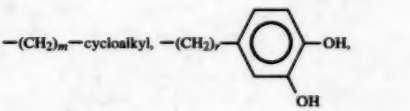


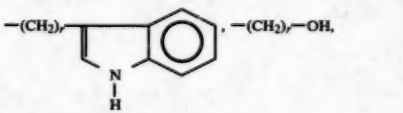
r is an integer from 1 to 4;
v is an integer from 2 to 4;
R_3 is hydrogen, lower alkyl,

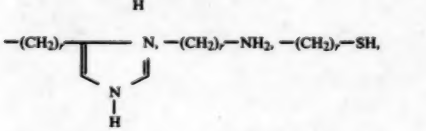


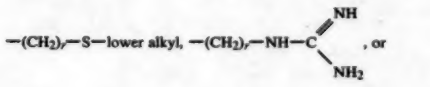


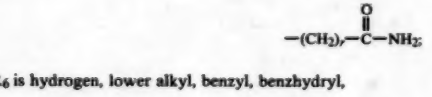




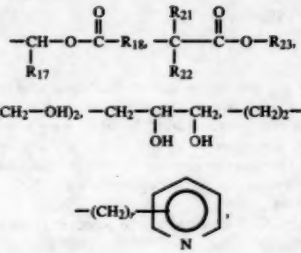








R_6 is hydrogen, lower alkyl, benzyl, benzhydryl,



or a pharmaceutically acceptable salt forming ion;

R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl;

R_{18} is hydrogen, lower alkyl, lower alkoxy or phenyl;

R_{21} and R_{22} are independently selected from hydrogen and lower alkyl; and

R_{23} is lower alkyl.

13. The method of treating hypertension in a mammalian host which comprises administering a hypotensively effective amount of the composition of claim 12.

4,638,011

TETRAHYDROTHIENYL SUBSTITUTED PROSTAGLANDIN ANALOGS

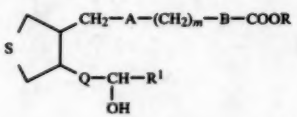
Jagabandhu Das, Plainsboro, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 17, 1984, Ser. No. 682,713

Int. Cl.[4] A61K *31/38*; C07D *333/24*

U.S. Cl. 514—438 **18 Claims**

1. A compound of the structure



including all stereoisomers thereof, wherein A is $(CH_2)_n$, —CH=CH— or a single bond; m is 1 to 8; B is —CH=CH— single bond, but where B is —CH=CH—, m is 1 to 6; Q is —CH=CH— or $-(CH_2)_n-$; n is 1 to 4; R is H, lower alkyl or alkali metal; and R^1 is lower alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl or lower alkoxy.

4,638,012

7-OXABICYCLOHEPTANE α-SUBSTITUTED KETONE PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

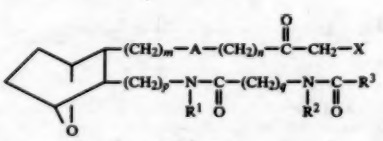
Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 5, 1985, Ser. No. 795,287

Int. Cl.[4] A61K *31/557, 31/34*; C07D *307/00*

U.S. Cl. 514—469 **18 Claims**

1. A compound having the structure



including all stereoisomers thereof, wherein m is 0 to 4; A is —CH=CH— or —CH_2—CH_2—; n is 1 to 5; X is halogen, alkanoyloxy or hydroxyl; p is 1 to 4; R^1 is H or lower alkyl; q is 1 to 12; R^2 is H or lower alkyl; and R^3 is H, lower alkyl, lower alkenyl containing 2 to 12 carbons, lower alkynyl containing 2 to 12 carbons, aryl, arylalkyl, lower alkoxy, aryloxy, amino, alkylamino, or arylamino, wherein lower alkyl or alkyl alone or as part of another group contains 1 to 12 carbons and is unsubstituted or is substituted with halo, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio;

aryl alone or as part of another group contains 6 to 10 carbons in the ring portion and is unsubstituted or is substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 hydroxy groups, 1 or 2 lower alkoxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups;

cycloalkyl alone or as part of another group contains 3 to 12 carbons and is unsubstituted or is substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups;

$(CH_2)_m$, $(CH_2)_n$ and $(CH_2)_p$ may contain 1 or 2 lower alkyl and/or 1 or 2 halo substituents; and $(CH_2)_q$ may contain one or more halo, hydroxy, alkoxy, amino, alkylamino, arylamino, amido, thioamido, thiol, alkylthio, arylthio, cyano or nitro groups.

17. A method of inhibiting platelet aggregation or inhibiting bronchoconstriction associated with asthma, which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,638,013

DIETETIC SUPPLEMENT AND PREPACKAGED FOOD IN WHICH IT IS CONTAINED, PROCESS OF PREPARATION AND METHOD OF ADMINISTRATION

Egidio A. Moja, Milan, and Gianluigi Gessa, Cagliari, both of Italy, assignors to Boehringer Biochemia Robin S.p.A., Italy

Filed Nov. 26, 1984, Ser. No. 674,853

Claims priority, application Italy, Nov. 30, 1983, 23959 A/83

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—561 **8 Claims**

1. A method for prolonging stage 4 sleep in humans which comprises administering to said humans, a tryptophan-free dietetic supplement comprising L-isoleucine, 4–16%; L-leucine, 9–27%; L-lysine, 7–20%; L-methionine, 9–27%; L-phenylalanine, 9–27%; L-threonine, 4–12%, and L-valine, 6–19%.

4,638,014

ANTICONVULSANT METHOD AND FORMULATIONS

C. Randall Clark, Auburn, Ala., assignor to Research Corporation, Tucson, Ariz.

Filed Aug. 26, 1985, Ser. No. 769,521

Int. Cl.[4] A61K *31/165*

U.S. Cl. 514—619 **5 Claims**

1. A method for treating or preventing convulsions in mammals in need of such treatment which comprises administering to said mammal an effective amount of a 3- or 4-amino-N-[(alkyl)$_n$phenyl)]benzamide or a pharmaceutically acceptable acid addition salt thereof, and wherein said alkyl group contains 1 to about 4 carbon atoms and n is 1 or 2.

4,638,015

EXPANDED POLYPROPYLENE FILMS

Jean-Noel M. Bertrand, Wezembeek-Oppem, Belgium, assignor to Montefina, S.A., Brussels, Belgium

Filed Sep. 30, 1985, Ser. No. 782,797
Claims priority, application Luxembourg, Oct. 8, 1984, 85577
Int. Cl.[4] C08J 9/08
U.S. Cl. 521—85 13 Claims

1. Films made of expanded polypropylene characterized by having (i) a uniform specific gravity d of from about 4.25×10^{-6} to about 6.50×10^{-6} Newton/mm^3, (ii) a crystallization temperature of from about 115° C. to about 135° C., and (iii) an elastic modulus Me expressed in Newton/mm^2 such that the ratio Me:d is from about 1.6×10^8 to about 2.0×10^8 mm.

4,638,016

PROCESS FOR PRODUCING HIGH DENSITY ELASTIC POLYURETHANE USING A COMBINATION OF 4-METHYL-1-(2-DIMETHYLAMINOETHYL) PIPERAZINE TOGETHER WITH ANOTHER TERTIARY AMINE CATALYST

Shoji Arai; Yutaka Tamano, and Masazumi Hasegawa, all of Yamaguchi, Japan, assignors to Toya Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,870
Int. Cl.[4] C08G 18/18
U.S. Cl. 521—129 8 Claims

1. Process for producing a high density elastic polyurethane of reduced weight which comprises a polyol having a molecular weight of 500–4,000, a cross linking agent, a blowing agent, an organic polyisocyanate which is a terminal isocyanate prepolymer which is the reaction product of polyisocyanate and/or of a mixture of polyisocyanate and a compound containing two or more active hydrogen atoms in the molecule, comprising employing as catalyst 4-methyl-1-(2-dimethylaminoethyl) piperazine or a mixture of 4-methyl-1-(2-dimethylaminoethyl)-piperazine and another tertiary amine compound as co-catalyst.

4,638,017

HYDROPHILIC POLYURETHANE/POLYUREA SPONGE

Wayne K. Larson, and Steven T. Hedrick, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 9, 1985, Ser. No. 806,758
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—157 15 Claims

1. A water-absorbing sponge comprising at least one of a sulfo- group containing polyurea and polyurethane, the polymer containing at least one sulfonate equivalent per 20,000 molecular weight units.

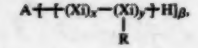
4,638,018

ACRYLIC TELOMERS WITH GRAFTS WHICH CAN BE CROSS LINKED BY LIGHT, THEIR SYNTHESIS AND THEIR APPLICATIONS IN COATING METALS

Gerard Bauduin; Bernard Boutevin, both of Montpellier; Willy-Jean Deiss, Grenoble, and Yves Pietrasanta, Meze, all of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

PCT No. PCT/FR84/00092, § 371 Date Dec. 10, 1984, § 102(e) Date Dec. 10, 1984, PCT Pub. No. WO84/04097, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 6, 1984, Ser. No. 686,547
Claims priority, application France, Apr. 11, 1983, 83 06066
Int. Cl.[4] C08F 2/50, 22/16, 20/38
U.S. Cl. 522—103 16 Claims

1. Telomers which can be cross linked by light, of the general formula



wherein Xi is a taxogen which is an acrylic acid or an ester thereof, R is a organic group which has at least one double bond which can be cross linked by light, x+y is less than or equal to 100 and A and H are the elements of a telogen, AH_β,

wherein AH_β is a mercaptan where A has the formula BS_β where B is an organic group and $\beta \leqq 2$,

and wherein

(1) taxogen Xi is an acrylic acid selected from the group consisting of acrylic, methacrylic, chloroacrylic, cyanoacrylic and itaconic acids, and

group R is produced by grafting a compound selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, glycidyl cinnamate, glycidyl cinnamylidene, glycidyl furylacrylate, glycidyl allylate, 2-(1-aziridinyl-)ethyl acrylate and methacrylate, 3-(1-aziridinyl)propyl acrylate and methacrylate, 4-(1-aziridinyl)butyl acrylate and methacrylate, 6-(1-aziridinyl)hexyl acrylate and methacrylate and 8-(1-aziridinyl)octyl acrylate and methacrylate; or

(2) taxogen Xi is an acrylic acid ester selected from the group consisting of a glycidyl acrylate, an aziridinyl acrylate, glycidyl methacrylate, and 2-(1-aziridinyl)ethyl methacrylate, and

group R is produced by grafting a compound selected from the group consisting of acrylic, methacrylic, cinnamic, cinnamylidic, and furylacrylic acids.

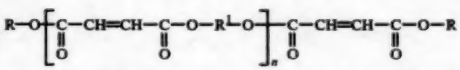
4,638,019

METHOD FOR RADICAL CROSS-LINKING OF ORGANIC POLYMERS

Wolfgang Von Gentzkow, Kleinsendelbach; Helmut Markert, Nürnberg; Hans Hauschildt, Erlangen, and Manfred Schmiedel, Nürnberg-Grossgründlach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,250
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307408
Int. Cl.[4] C08J 3/24/3/28
U.S. Cl. 522—104 6 Claims

1. In a method for radical cross-linking of an organic polymer in the presence of a cross-linking enhancer, the improvement which comprises using as said enhancer an oligomeric ester of the following formula



wherein R is alkenyl or alkynyl; R^1 is alkylene, alkenylene, alkynylene or $-(R^2-O)_m-R^2-$, with R^2 being CH_2, $(CH_2)_2$, $(CH_2)_3$ or $CH_2-CH(CH_3)$, and m being 1 to 50; n is 1 to 10; said method is carried out in the absence of polythiol; and the cross-linking enhancer is present in an amount of from 0.1 to 10 mass percent, relative to the weight of the polymer.

4,638,020

AQUEOUS COMPOSITION COMPRISING A PHOSPHATED EPOXY AND NON-SELF DISPERSIBLE RESIN

Roger M. Christenson, Gibsonia; Mary E. Rosenberger, Allison Park, and Marvin T. Tetenbaum, Wexford, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 23, 1984, Ser. No. 674,452
Int. Cl.[4] C08L 63/02
U.S. Cl. 523—406 30 Claims

1. An aqueous composition comprising:

(i) a resin which is non-self dispersible with a base, in water,

(ii) a non-gelled phosphated-epoxy which is derived from reacting a 1,2-epoxy material with a phosphoric acid, said phosphated-epoxy being present in an amount sufficient to effect dispersion of the resin of (i) in the aqueous composition,

(iii) a neutralizing base, and

(iv) water.

4,638,021

EPOXY RESIN COMPOSITION

Toshiharu Ando, Itami, and Masaru Tsuchihashi, Sanda, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,304
Int. Cl.[4] C08L 63/00
U.S. Cl. 523—457 6 Claims

1. An epoxy resin composition which comprises a mixture a) obtained by mixing:

(i) 100 parts by weight of a polybasic carboxylic acid anhydride, with

(ii) from 10–70 parts by weight of a compound having at least 2 phenol groups in the molecule,

(iii) an epoxy resin having at least 2 epoxy groups in the molecule,

(iv) powered alumina, and

(v) from 0.05–5 parts by weight of zinc octylate.

4,638,022

MOLDING COATING COMPOSITION AND PROCESS

Carroll W. Cope, Marion, Va., assignor to DG Shelter Products, Marion, Va.

Filed Mar. 24, 1986, Ser. No. 843,203
Int. Cl.[4] C08K 11/00
U.S. Cl. 524—15 3 Claims

1. A basecoat formulation for forming a coating on wood or plastic surfaces, said coating capable of accepting a wood-colored stain, comprising, in parts by volume:

water-miscible thickener	0.179 part
dimethyl ethanol	0.187
defoamer	0.227
water dispersing resins	0.837
wetting agent	0.847
priming pigments	2.960
inert pigment	3.393
talc pigment	10.464
colloidal defoamer	0.194
fungicide	0.129
coalescer	1.629
acrylic emulsion	41.333
acrylic resin	12.748
pecan shell flour	2.326
water	24.875

4,638,023

PROCESS FOR THE PRODUCTION OF REAGENT FILMS AND REAGENT FILMS PRODUCED THEREBY

Heinz-Freidrich Trasch, Ludwigshafen; Anselm Rothe, Birkenau; Bernward Sojka, Viernheim; Wolfgang Werner, Mannheim, and Hans Wielinger, Weinheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,089
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1984, 3406328
Int. Cl.[4] G01N 31/22, 33/52
U.S. Cl. 524—21 7 Claims

1. In a process for the production of reagent films of the type comprising applying a coating of an aqueous synthetic resin dispersion which contains adjuvants and reagents onto a solid substrate or onto a thin fabric in a thin layer, and thereafter drying said thin layer on said substrate or fabric;

the improvement comprising:

adding to the aqueous synthetic resin dispersion used for the coating, 0.5 to 5% by weight of a scleroprotein hydrolysate with a molecular weight of from 5000 to 50,000 which is cold soluble in said dispersion and 0.5 to 10% by weight of a higher alcohol containing 5 to 10 carbon atoms.

4,638,024

POLYMER COMPOSITION COMPRISING A PROTEIN AND A BLOCK COPOLYMER WHICH CONTAINS A POLYVINYL ALCOHOL POLYMER UNIT AND AN IONIC POLYMER UNIT

Toshiaki Sato; Junnosuke Yamauchi, both of Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 3, 1985, Ser. No. 730,100
Claims priority, application Japan, May 14, 1984, 59-97359; Jun. 7, 1984, 59-117858
Int. Cl.[4] C08L 29/04, 53/00, 89/00
U.S. Cl. 524—22 5 Claims

1. A polymer composition comprising:

a block copolymer containing a polyvinyl alcohol polymer unit as one constituent and a polymer unit having an ionic group as another constituent; and

at least one protein;

wherein the polyvinyl alcohol polymer unit has at least 20 mole percent of vinyl alcohol units and has a degree of polymerization of from 10 to 3500, and contains up to 20 mole percent of other monomeric components; wherein the ratio by weight of the polyvinyl alcohol polymer unit to the polymer unit having an ionic group in the block copolymer is in the range of from 0.2 to 50; wherein the polymer unit having an ionic group contains 0.5 to 100 mole percent of the ionic group based on the polymer unit having an ionic group; and further wherein the ratio by weight of protein to the block copolymer is in the range of from 10/90 to 99/1.

4,638,025

PIGMENTED WATER-ABSORBABLE PLASTIC MATERIALS

Ari Fuhrman, Miami Beach, Fla., assignor to Color Optics, Ltd., N.Y.

Continuation of Ser. No. 347,082, Feb. 8, 1982, abandoned. This application Apr. 17, 1985, Ser. No. 724,039
Int. Cl.[4] G02C 7/04; C08F 220/28
U.S. Cl. 524—40 11 Claims

1. A colored opacified plastic material comprising an organic binder, at least one pigment, a water-absorbable plastic material and a cross-linking agent, wherein said organic binder is cellulose acetate butyrate in a concentraction of from about 0.4 to 0.74% by weight and said water-absorbable plastic material is 2-hydroxyethylemthacrylate in a concentration of from about 96 to 99% by weight.

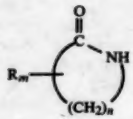
4,638,026

OZONE-STABILIZED RUBBERY ELASTOMERS

Bernard Sambuis, Montgeron, and Daniel Gavory, Epinay sur Orge, both of France, assignors to Vulnax International Limited, Saint-Cloud, France

Filed Oct. 19, 1984, Ser. No. 662,517
Claims priority, application France, Oct. 19, 1983, 83 16854
Int. Cl.[4] C08K 5/34, 5/13; C09K 15/16, 15/22
U.S. Cl. 524—98 15 Claims

1. A composition of matter comprising (i) a natural or synthetic rubbery elastomer, said elastomer having incorporated therein (ii) 0.1 to 5% by weight of said rubbery elastomer (i) of a lactam antiozonant having the general formula:



(I)

wherein n is an integer ranging from 3 to 20, m is 1 or 2, and R is lower alkyl or phenyl.

4,638,027

POLYCARBONATE EXHIBITING IMPROVED HEAT RESISTANCE FROM CYCLOALKYLIDENE DIPHENOL

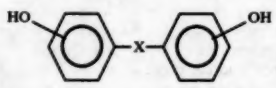
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 453,105, Dec. 27, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,098
Int. Cl.[4] C08G 63/62
U.S. Cl. 524—157 33 Claims

1. A thermoplastic, linear, high molecular weight, end-capped aromatic polycarbonate polymer exhibiting improved heat resistance which remains thermoplastic after heating for a time of about one hour at about 195° C. in air derived from:

(i) a carbonate precursor; and

(ii) at least one dihydric phenol represented by the general formula



wherein X is selected from monocyclic cycloalkylidene radicals containing from 12 to about 16 rings carbon atoms.

4,638,028

RUBBER POLYMERASES AND METHODS FOR THEIR PRODUCTION AND USE

Joseph H. Lui, Akron, and David S. Shreve, Mogadore, both of Ohio, assignors to Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 8, 1985, Ser. No. 720,740
Int. Cl.[4] C08K 5/05
U.S. Cl. 524—387 7 Claims

1. A process for stabilizing natural rubber latex which comprises adding to said natural rubber latex a stabilizing composition comprising a polyhydroxy compound, an antimicrobial agent, and a buffer.

4,638,029

CERAMIC COMPOSITION AND PROCESS FOR USE THEREOF

Debra J. Meschke, Valley Cottage, N.Y.; Kenneth L. Hoy, St. Albans, and Louis F. Theiling, Jr., Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 641,640, Aug. 17, 1984, which is a continuation-in-part of Ser. No. 468,670, Feb. 22, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,181
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—430 39 Claims

1. A ceramic composition comprising a ceramic material, clay, a dispersant and a polymeric binder, the binder comprising a connected branch copolymer comprising:

(A) a core segment having a valence of v, wherein v is an integer, and having correspondingly v terminal bonds each connected to one of a group of:

(B) v polyvalent, non-crosslinked branched polymer segments each having an average of t terminal bonds, wherein t is greater than about two, one of said terminal bonds being connected to said core segments, and each of said branched polymer segments being connected via its remaining (t−1) terminal bonds to:

(C) a set of linear polymer segments, with an average of t−1 linear polymer segments per set, to provide a group of about v(t−1) linear polymer segments wherein the linear polymer segments have substantially similar chain lengths and composition within said group, the connected branch copolymer having a group of terminal linear polymer segments bearing terminal groups capable of effecting hydrogen bonding.

4,638,030

POLYPROPYLENE INTERIOR PARTS FOR AUTOCARS

Hiroyoshi Asakuno, Ichihara; Kinya Mori, Chiba; Kiyoaki Suzuki, Ichihara; Mamoru Nishida, Chiba; Kenji Iwai, Ichihara; Masahiro Tamamushi, and Teruo Kawasaki, both of Yokohama, all of Japan, assignors to Chisso Corporation, Osaka and Nissan Motor Co. Ltd., Kanagawaken, both of, Japan

Filed Jun. 25, 1985, Ser. No. 748,438
Claims priority, application Japan, Jul. 9, 1984, 59-141844
Int. Cl.[4] C08L 23/16, 53/00
U.S. Cl. 524—536 2 Claims

1. Polypropylene interior parts for autocars, obtained by molding a material comprising a propylene-ethylene block copolymer prepared by

(1) polymerizing propylene in a first stage so that the resulting propylene homopolymer has a relation between its isotactic pentad ratio (P) and MFR of $1.00 \geqq P \geqq 0.015 \log MFR + 0.955$ and amounts to 70 to 95% by weight of the block polymer,

(2) thereafter polymerizing ethylene or ethylene and propylene in an amount of 30 to 5% by weight of the total polymerization quantity in at least one other stage, so as to give an ethylene content occupying 3 to 12% by weight of the block polymer,

(3) blending 5 to 30% by weight of a filler into said block polymer,

said interior parts having

(a) a percentage opening of the cross section perpendicular to the direction of the major axis thereof of 20 to 48%;

(b) two or more fixed points at a fixing patch of 300 mm or less; and

(c) a geometrical moment of inertia in the cross section at the central part between the fixed points of at least 50 mm^4.

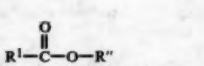
4,638,031

PROCESS FOR PREPARING SUPERIOR HIGH SOLIDS COATINGS

Constantine J. Bouboulis, Union, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 558,953, Dec. 7, 1983, Pat. No. 4,532,294. This application Feb. 14, 1985, Ser. No. 701,680
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] C08K 5/10; C08L 33/14
U.S. Cl. 524—773 17 Claims

1. An improved process for forming acrylic copolymer resins suitable for electrostatic spraying in high solids coatings containing at least 50 wt % solids which comprises contacting under polymerizing conditions a polymerization mixture comprising at least one hydroxy-substituted alkyl (methyl)acrylate monomer and at least one non-hydroxy substituted alkyl (meth)acrylate monomer in the presence of a free radical initiator and a solvent therefor, said solvent being employed in an amount of from about 10 to 70 wt. % of the polymerization mixture, and said solvent comprising at least one normally liquid ester selected from the group consisting of compounds having the formula:



wherein R^1 is a straight or branched chain alkyl of 1 to 6 carbon atoms, and R" is a straight or branched chain alkyl of 8 to 13 carbon atoms, with the proviso that R^1 and R" together contain from 11 to 15 carbon atoms, said hydroxy-substituted alkyl (meth)acrylate monomer comprising from about 5 to 40 wt % of the total monomers charged to said polymerization reaction, and said non-hydroxy substituted alkyl (meth)acrylate monomer comprising from about 5 to 95 wt % of the total monomers charged to said polymerization reaction.

4,638,032

MAGNETIC PARTICLES AS SUPPORTS FOR ORGANIC SYNTHESIS

Steven A. Benner, Cambridge, Mass., assignor to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 449,399, May 31, 1983, abandoned. This application Aug. 10, 1984, Ser. No. 640,027
Claims priority, application Canada, Dec. 12, 1983, 443105; European Pat. Off., Dec. 12, 1983, 82103253.7
Int. Cl.[4] C08F 283/12; H01F 1/00; C09D 5/23
U.S. Cl. 525—54.11 28 Claims

1. Oligomer synthesis support comprising a magnetic particle covalently bound to oligomer subunits, said oligomer subunits comprising subunits of deoxyribonucleic acid or ribonucleic acid.

4,638,033

RESINOUS COMPOSITION OF A CARBONATE RESIN AND A GRAFTED DERIVATIVE OF ETHYLENE-PROPYLENE-DIENE TERPOLYMER EXHIBITING IMPROVED RESISTANCE TO ORGANIC SOLVENTS

Omar M. Boutni, Mt. Vernon, Ind., and Ping Y. Liu, Naperville, Ill., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 23, 1985, Ser. No. 812,264
Int. Cl.[4] C08L 69/00
U.S. Cl. 525—67 38 Claims

1. An improved resin composition exhibiting improved resistance to organic solvents comprising (i) a blend comprised of at least one aromatic carbonate resin and at least one grafted derivative of an ethylene-propylene-diene terpolymer; the improvement comprising said composition additionally comprising (ii) an amount at least effective to improve the impact properties and resistance to organic solvents of said blend of a least one polymer selected from

(a) a polyolefin,

(b) an olefin-acrylate or methacrylate copolymer, or

(c) a selectively hydrogenated linear, sequential or radial teleblock copolymer of a vinyl aromatic compound and an olefinic elastomer.

4,638,034

PREPARATION OF ETHYLENE-ACRYLIC ACID COPOLYMER OR SALT THEREOF

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, Va.

Filed Jun. 24, 1985, Ser. No. 747,591
Int. Cl.[4] C08F 8/00
U.S. Cl. 525—369 13 Claims

1. A process for preparing an ethylene-acrylic acid copolymer salt which comprises saponifying an ethylene-alkyl acrylate copolymer in the molten state, in the absence of solvent or water other than by-product alkanol, with alkali metal hydroxide or alkaline earth metal hydroxide under non-static mixing conditions so as to thereby form alkanol and an alkali metal or alkaline earth metal salt of ethylene-acrylic acid copolymer, and separately recovering said alkanol and said salt.

4,638,035

CATALYST SYSTEMS FOR TWO-PACK ACRYLIC ADHESIVE FORMULATIONS

Vincent D. McGinniss, Delaware, Ohio, assignor to Three Bond Co., Ltd., Tokyo, Japan

Division of Ser. No. 416,270, Sep. 9, 1982, Pat. No. 4,446,246. This application Jun. 29, 1984, Ser. No. 603,592
Int. Cl.[4] C80F 4/32
U.S. Cl. 525—384 6 Claims

1. A method for catalytically curing a curable mixture comprising at least one ethylenically unsaturated compound which is curable in the presence of a peroxide initiator and said peroxide initiator therefor, which comprises blending with said ethylenically unsaturated compound a catalyst system comprising said peroxide initiator, a furfuryl alcohol, and an acid catalyst, the proportion of said acid catalyst being an effective proportion for catalyzing said furfuryl alcohol and the proportion of furfuryl alcohol being adequate in the generation of heat with the acid catalyst to generate free radicals from said peroxide initiator for curing said ethylenically unsaturated compound.

4,638,036

POLYCARBONATE EXHIBITING IMPROVED HEAT RESISTANCE FROM HALOGENATED CYCLOALKYLIDENE DIPHENOL

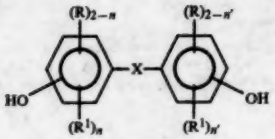
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 621,472, Jun. 18, 1984, Pat. No. 4,554,330, which is a continuation-in-part of Ser. No. 453,105, Dec. 27, 1982, abandoned. This application Sep. 6, 1985, Ser. No. 773,138
Int. Cl.[4] C08G 63/64
U.S. Cl. 525—462 18 Claims

1. Thermoplastic linear polycarbonate resin composition comprising the polymeric reaction products of:

(a) a carbonate precursor, and

(b) at least one dihydric phenol represent by the general formula



wherein

R is independently selected from hydrogen or lower alkyl radicals,

R^1 is indepdently selected from halogen radicals,

X is selected from monocyclic cycloalkylidene radicals containing from 12 to about 16 ring carbon atoms, and

n and n' are independently selected from whole numbers having a value of from 0 to 2 inclusive, with the proviso that the sum of n plus n' is at least one.

4,638,037

METHOD OF INCREASING MOLECULAR WEIGHT OF POLY(ARYL ETHERS)

Mary V. Ward, Middlesbrough; Eric Nield, and Philip A. Staniland, both of Cleveland, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 4, 1984, Ser. No. 607,308

Claims priority, application United Kingdom, May 12, 1983, 8313110

Int. Cl.[4] C08F *283/00;* **C08G** *14/00, 16/00;* **C08L** *61/00*

U.S. Cl. 525—471 **14 Claims**

1. A method of increasing the molecular weight of a poly(aryl ether) comprising providing a mixture of (1) at least one polyaryl ether comprising polymer chains having end groups of the formula

—Ar—X

and (2) a reagent having nucleophilic activity selected from alkaline salts of Group I and Group II metals, the alkaline salts being salts of a species of pK value of at least 2.5 for the dissociation step, or for the first dissociation step where the species is multifuntional, or an oxide or hydroxide of a Group I or Group II metal, wherein Ar represents an arylene radical and X is a monovalent radical capable of nucleophilic displacement from Ar and heating the mixture to a temperature above the melting point of the polymer until a desired increase in molecular weight has occurred.

4,638,038

CARBOXYLIC ACID-GRAFTED PHENOXY RESINS

George A. Salensky, Hunterdon County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 22, 1985, Ser. No. 725,535

Int. Cl.[4] C08G *59/14, 59/16;* **C08L** *63/00*

U.S. Cl. 525—533 **15 Claims**

1. A phenoxy resin having pendant secondary hydroxyl groups of which about 3 to about 50% of such hydroxyl groups have been reacted to produce moieties having pendant carboxyl groups.

4,638,039

ALTERNATING BLOCK COPOLYMERS OF POLYARYLENE POLYETHERS AND PROCESS FOR THEIR PREPARATION

Virgil Percec, Pepper Pike, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 28, 1984, Ser. No. 655,925

Int. Cl.[4] C08F *283/00;* **C08G** *75/00*

U.S. Cl. 525—534 **9 Claims**

1. A substantially linear thermoplastic polyarylene polyether copolymer (PAPE) represented by the formula

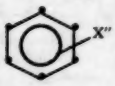
R^e—O—"PAPE"—O—R^e

wherein,

R^e represents a residuum selected from $R_1{}^eX'$ and $R_2{}^eRH$;

$R_1{}^eX'$ represents a residuum of a reactive bis(haloallyl)moiety "HAM";

$R_2{}^e$ represents the group



X' represents halogen selected from the group consisting of fluorine, chlorine and bromine;

X" represents an inert substituent defined hereinbelow; and,

"PAPE" represents the residuum of an oligomer selected from an unsaturated alternating block copolymer represented by

["DHP_1"—"DHP_2"—$_{n'}$—HAM—"DHP_3"—$_{n''}$

and a regular unsaturated oligomer formed by chain extension represented by

[HAM—"DHP_1"—"DHP_2"—HAM]$_{n'''}$

wherein, "DHP_1" and "DHP_2" are the residues of dihydric phenols DHP_1 and DHP_2 which are the same or different, and "DHP_3" is the residue of a dihydric phenol DHP_3 which may be the same as either DHP_1 or DHP_2, or different;

HAM represents the residue of a reactive bis(haloallyl)moiety selected from a bis(haloallyl)olefin having from 4 to about 20 carbon atoms including cis- or trans-dichlorobutene, a bis(haloallyl)cycloolefin having from 4 to about 8 ring carbon atoms including 1,4-bis(chloromethy)-1,3-cyclohexadiene, and a bis(haloallyl)arylene having from 8 to about 26 carbon atoms including 1,4-bis(chloromethyl)-benzene; and,

n', n" and n"' independently represent an integer in the range from 2 to about 100.

4,638,040

ACRYLATE AND METHACRYLATE MONOMERS AND POLYMERS

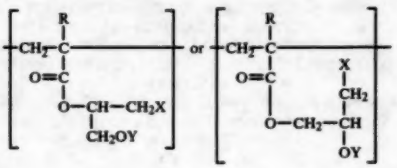
W. James Hammar, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 500,782, Jun. 3, 1983, Pat. No. 4,578,504. This application May 17, 1985, Ser. No. 735,377

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—245 **24 Claims**

1. A polymer comprising monomeric structural units:

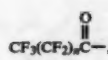


or combinations thereof, wherein

R is hydrogen or methyl;

X is fluoro, chloro, bromo, iodo, perfluoroalkyl-sulfonoxy of one to three carbon atoms, perfluoroacyloxy of one to three carbon atoms, benzoyloxy, or trichloroacetoxy;

Y is trichloroacetyl, perfluoroacyl of the formula



trialkylsilyl of the formula $[CH_3(CH_2)_m]_3Si$—, wherein n is zero to six; and m is zero to three; said polymer having a molecular weight in the range of 100,000 to 1,000,00.

4,638,041

FLUOROOXYALKYL VINYL ETHERS

Akira Ohmori; Nobuyuki Tomihashi; Hiroshi Inukai, and Kazuhiro Nakai, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

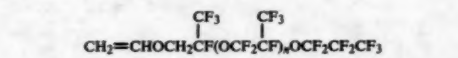
Division of Ser. No. 713,609, Mar. 19, 1985, Pat. No. 4,568,773. This application Oct. 4, 1985, Ser. No. 784,590

Claims priority, application Japan, Mar. 22, 1984, 59-55724

Int. Cl.[4] C08F *14/18*

U.S. Cl. 526—247 **4 Claims**

1. A polymer comprising a fluorooxyalkyl vinyl ether of the formula:



wherein n is an integer of 0 to 5.

4,638,042

COPOLYMERS CONTAINING INDENE

George S. Li, Solon; Muyen M. Wu, Hudson, and Elmer J. De Witt, Cuyahoga Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 5, 1986, Ser. No. 859,521

Int. Cl.[4] C08F *32/06*

U.S. Cl. 526—280 **2 Claims**

1. Normally solid copolymers that are the result of addition polymerization of methyl methacrylate and indene, containing the monomers combined in the polymer structure in the following weight percentages:

	Weight Percent
Methyl methacrylate	46–95
Indene	54–5.

4,638,043

DRUG RELEASE SYSTEM

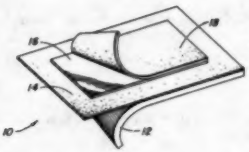
Michael Szycher, Lynnfield; Donald J. Dempsey, Newbury, and Jonathan L. Rolfe, North Easton, all of Mass., assignors to Thermedics, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 670,810, Nov. 13, 1984. This application Aug. 23, 1985, Ser. No. 768,623

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] C08G *18/10*; A61F *13/00*

U.S. Cl. 528—75 **26 Claims**



1. A drug releasing member for incorporation into a medical patch comprised of a drug dispensing polyurethane having a therapeutically effective amount of a drug or drugs dispersed therein and capable of being released in a sustained manner, said polyurethane consisting essentially of the reaction product of:

(a) a diisocyanate;

(b) a glycol having a number average molecular weight between the range of 500–5000 molecular weight units; and

(c) an acrylyl chain terminator having a number average molecular weight between the range of 40–200 molecular weight units; and wherein there are 2 diisocyanate units for each glycol unit, and there is only one acrylyl group terminator at each end of the polyurethane chain.

4,638,044

PROCESS FOR PREPARING POLY(ARYL ETHER KETONE)S

Donald R. Kelsey, Hillsborough, N.J., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 20, 1985, Ser. No. 713,845

Int. Cl.[4] C08G *8/02*

U.S. Cl. 528—125 **11 Claims**

1. An improved process for preparing poly(aryl ether ketone)s by reacting a mixture of at least one bisphenol and at least one dihalobenzenoid compound, or a halophenol, wherein the improvement comprises providing to the reaction a combination of sodium carbonate and/or bicarbonate and an alkali metal halide selected from potassium, rubidium or cesium fluoride or chloride, or combinations thereof.

4,638,045

NON-PEPTIDE POLYAMINO ACID BIOERODIBLE POLYMERS

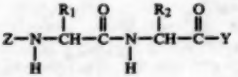
Joachim Kohn, Brookline, and Robert S. Langer, Somerville, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 19, 1985, Ser. No. 703,153

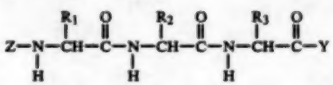
Int. Cl.[4] C07K *1/06*

U.S. Cl. 530—323 **14 Claims**

1. A bioerodible polymer formed by polymerizing a dipeptide formed exclusively of L-alpha amino acids of the formula:



or by polymerizing a tripeptide formed exclusively of L-alpha amino acids of the formula:



wherein at least one of Z or Y is an amine or carboxyl protecting group and wherein polymerization is effected through at least one of R_1, R_2 or R_3 without the formation of additional peptide bonds through the terminal, amine and carboxyl groups of said dipeptide or tripeptide.

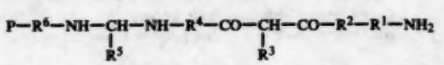
4,638,046

RETRO-INVERSO C-TERMINAL HEXAPEPTIDE ANALOGUES OF SUBSTANCE P

Antonio S. Verdini, and Giuseppe C. Viscomi, both of Rome, Italy, assignors to ENI-Ente Nazionale Idrocarburi, Rome, Italy

Filed Jan. 9, 1985, Ser. No. 689,911
Claims priority, application Italy, Jan. 13, 1984, 19142 A/84
Int. Cl.[4] C07K 7/02
U.S. Cl. 530—332 15 Claims

1. Compounds corresponding to general formula I:



in which P is a hydrogen atom, a linear or branched aliphatic alkyl group with 1–6 carbon atoms, or a saturated or unsaturated linear or branched chain aliphatic acyl group such as formyl, acetyl, propionyl, n-butyryl, isobutyryl, n-valeryl, isovaleryl, hexanoyl, isohexanoyl, heptanoyl, octanoyl, crotonoyl, methacryloyl, acryloyl; or a substituted acyl group such as hydroxyacetyl, 2-hydroxypropionyl, 3-hydroxypropionyl, aminoacetyl, 4-hydroxyphenylacetyl, 4-hydroxyphenylpropionyl, 2-aminopropionyl, 3-aminopropionyl, O-ethylmalonyl, ethoxyformyl, methoxyacetyl, 3-methoxypropionyl, 3-ethoxypropionyl, chloroacetyl, dichloroacetyl, 2-chloropropionyl, 3-chloropropionyl, 2,3-dichloropropionyl, bromoacetyl, 4-hydroxy-3,5-diiodophenylacetyl, 3-oxobutyryl, 3-oxovaleryl, 4-oxovaleryl, methylthioacetyl, 3-methylthiopropionyl, ethylthioacetyl, 3-ethylthiopropionyl, nicotinoyl, 4-aminobutyryl, N^{α}-[(1-(9-adenyl)β-D-ribofuranuronosyl)], N^{α}-[(1-(9-hypoxanthyl)-β-D-ribofuranuronosyl]; or a group such as benzyloxycarbonyl, tert-butyloxycarbonyl, tert-amyloxycarbonyl, isobornyloxycarbonyl, adamantyloxycarbonyl, or chloro or nitro-substituted benzyloxycarbonyl;

R^1 is a residue of methionine, methioninesulphoxide, methionine sulphone, selenomethionine, leucine, norleucine, valine or norvaline;

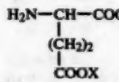
R^2 is a residue of leucine, norleucine, valine, norvaline, alanine or isoleucine;

R^3 is a hydrogen atom or methyl;

R^4 is an amino acid residue of D configuration such as phenylalanine, tryptophan, tyrosine, valine, norvaline, leucine, norleucine, isoleucine, serine or derivatives, threonine or derivatives, histadine or derivatives, methionine, methionine-S-methyl, methionine sulphone, arginine or derivatives, lysine or derivatives, ornithine or derivatives, 2,4-diaminobutyric acid or derivatives, 2,3-diaminopropionic acid or derivatives, glutamic acid or aspartic acid or their suitable derivatives;

R^5 is a hydrogen atom or the side-chain of amino acids such as phenylalanine, tyrosine, 4-chlorophenylalanine, O-benzyltyrosine (or their acetyl, cyclopentyl, tert-butyloxycarbonyl or 4-hydroxyphenylacetyl derivatives);

R^6 is an amino acid residue such as glutamine or derivatives, pyroglutamic acid, alanine, tyrosine, lysine or derivatives, proline, N-formyl-proline, β-alanine, N-acetyl-β-alanine, glycine, desaminophenylalanine, desaminoaspartic acid, methyldesaminoaspartic acid, or glutamic acid esters represented by general formula (II):



in which X is methyl, ethyl, methoxyethyl, methoxy(ethoxy)$_n$ethyl where n=1, 2 or 3.

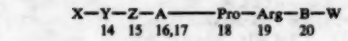
4,638,047

ENZYME INHIBITION

Michael Szelke, Ruislip, and David M. Jones, Hayes, both of England, assignors to Aktiebolaget Hassle, Sweden

PCT No. PCT/GB84/00063, § 371 Date Oct. 31, 1984, § 102(e) Date Oct. 31, 1984, PCT Pub. No. WO84/03507, PCT Pub. Date Sep. 13, 1984
PCT Filed Feb. 28, 1984, Ser. No. 668,277
Claims priority, application United Kingdom, Mar. 4, 1983, 8305985
Int. Cl.[4] C07K 5/02, 7/06
U.S. Cl. 530—332 7 Claims

1. Polypeptide analogues of the formula:



(I)

where

X=H or an N-protecting group:

F, Cl, Br, I, $-CF_3$, —OH, —OR or —R (R=C_1–C_6 alkyl) or R—O—CO— where R=t-butyl, benzyl, 2,2,2-trichloroethyl

or R^6—SO_2— where R^6=Ph, α-naphthyl β-naphthyl

or one or more amino acyl residues either as such or in protected form bearing a group X above

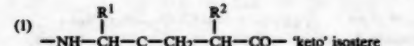
Y=absent, or glycine, or D- or L-phenylalanine or a lipophilic amino acid residue selected from the group consisting of Phg, Cha, α—Nal, β—Nal and p-iodophenylalanyl

Z=L- or D-proline or a ring homologue selected from the group consisting of azetidine-2-carboxylic acid and piperidine-2-carboxylic acid or L- or D-valine or N-methyl-alanine or glycine

or Y and Z are as:

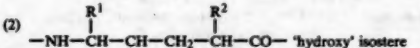
where the peptide bond —CO—NH— between Y and Z has been reduced (and protected) to give —CH_2—(X)—, X being a protective group as defined above

A=



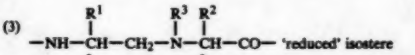
(II)

(1) —NH—CH(*)—C(=O)—CH_2—CH(*)—CO— 'keto' isostere



(III)

(2) —NH—CH(*)—CH(OH)—CH_2—CH(*)—CO— 'hydroxy' isostere



(IV)

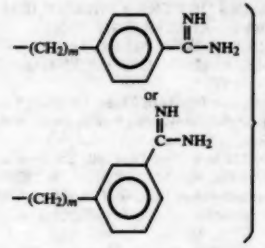
(3) —NH—CH(*)—CH_2—N(R^3)—CH(*)—CO— 'reduced' isostere

where:

(i) R^1 = —$(CH_2)_n$—NH—C(=NH)—NH_2 with n = 2-4

or

-continued



(ii) R^2=H, lower alkyl (C_1–C_4) or 1-hydroxy-ethyl,
(iii) R^3=group X as defined above
(iv) configuration at the asymmetric centres * is either R or S

Arg or Pro and Arg may be absent, Pro or Pro substituted with hydroxy-proline and arg or Arg substituted with Z^1, Tos or —NO_2

B=D or L-valine or D or L-proline or —NH—(CH_2)$_n$—CO—, where n=0–5, or absent

W=—OH —OR^4 where R^4=lower alkyl (C_1–C_5), —NH_2—, —NHR_2^5 or —NH^5 where R^5=lower alkyl (C_1–C_5), cycloalkyl C_3C_7 or cycloalkyl substituted with a group selected from carboxyl and alkyl (C_1–C_5) group(s)

B-W represents an aminoalcohol derivative of B as such or in protected form

and where further in said compounds of formula I the two terminals are optionally linked by a peptide bond to form a cyclic structure.

4,638,048

METHOD OF EXTRACTING CRYOPRECIPITATE FROM FROZEN BLOOD PLASMA

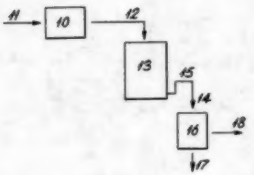
Peter R. Foster, Edinburgh, Scotland, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 691,736, Jan. 16, 1985, abandoned, which is a continuation of Ser. No. 558,558, Dec. 5, 1983, abandoned, which is a continuation of Ser. No. 362,517, Mar. 26, 1982, abandoned. This application Feb. 12, 1986, Ser. No. 828,608

Claims priority, application United Kingdom, Apr. 2, 1981, 8110354

Int. Cl.⁴ A23J *1/06*; B01D *17/00*; C07K *3/26*

U.S. Cl. 530—380 **5 Claims**



1. A method of extracting cryoprecipitate from frozen blood plasma, which comprises:

crushing the frozen plasma obtained from a multiplicity of individual blood donations;

conveying the crushed plasma to a bulk thawing zone;

continuously circulating the crushed plasma in said zone to rotate around an upright axis and, at the same time, to move respectively upwardly and downwardly in the circumferentially peripheral and axially central regions of said zones, and radially between these zone regions;

steadily heating the exterior of said zone during said circulation to thaw said crushed plasma to produce liquor and cryoprecipitate in mixture with the remainder of said crushed plasma;

progressively removing, as it is formed, said liquor and cryoprecipitate from the lowermost region of said zone by way of a path which extends therefrom initially in an opposite direction to that of said rotation, and also upwardly and then downwardly;

and mutually separating said removed liquor and cryoprecipitate.

4,638,049

ANTITUMOR PROTEIN HYBRID AND PROCESS FOR THE PREPARATION THEREOF

Yasuhiko Masuho, Hino; Takeshi Hara, Hachioji, and Teruhisa Noguchi, Fujisawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 4, 1980, Ser. No. 137,193

Claims priority, application Japan, Apr. 9, 1979, 54-41919

Int. Cl.⁴ C07K *15/14*

U.S. Cl. 530—388 **9 Claims**

1. Antitumor protein hybrid comprising (1) a moiety which is substantially the fragment Fab of an antitumor immunoglobulin and (2) a moiety which is substantially the fragment A of a diphtheria toxin, which antitumor protein hybrid is expressed by the following formula (I):

$$Fab—S_1—(X)_n—S_2—FA)_m \quad (I)$$

where FAB indicates a moiety which is substantially the fragment FAB of an antitumor immunoglobulin; FA indicates a moiety which is substantially the fragment A of a diphtheria toxin; X indicates a divalent organic radical; S_1 and S_2 are both sulfur atoms, S_1 indicating a sulfur atom arising from the disulfide bond in the immunoglobulin and S_2 a sulfur atom arising from the disulfide bond in the diphtheria toxin; n represents 0 or 1 and m represents an integer of 1 to 5.

4,638,050

THROMBIN-BINDING SUBSTANCE AND PROCESS FOR ITS PRODUCTION

Nobuo Aoki, Tokyo, Japan, and Shinichiro Kurosawa, Oklahoma City, Okla., assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Mar. 20, 1985, Ser. No. 713,821

Claims priority, application Japan, Mar. 23, 1984, 59-55792

Int. Cl.⁴ C07K *3/20, 3/28*

U.S. Cl. 530—413 **5 Claims**

1. A thrombin-binding substance derived from human tissue and obtained by (1) extracting human tissue with a buffer containing a non-ionic surfactant, and (2) isolating the said thrombin-binding substance in pure form from the resulting extract by diisopropylphosphorothrombin affinity chromatography, gel filtration, or a combination thereof; said thrombin-binding substance having the following properties:

(a) molecular weight: 88,000±20,000 in reduced form, and 71,000±20,000 in unreduced form;

(b) isoelectric point: pH 4.2±0.5;

(c) affinity: strong for thrombin;

(d) activity: capable of promoting the thrombin-catalyzed activation of protein C and prolonging clotting time; and

(e) stability: stable over a pH range of 2 to 10 and stable to denaturing agents and to a pepsin treatment.

4,638,051

BRAIN IMAGING RADIOPHARMACEUTICALS

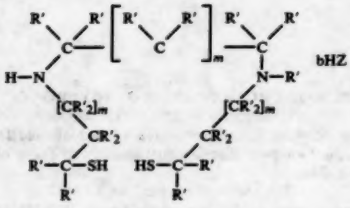
Hugh D. Burns, BelAir; Susan E. Zemyan; Leon A. Epps, both of Baltimore; Alfred V. Kramer, and Robert F. Dannals, both of Baltimore, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 605,368, Apr. 30, 1984, abandoned. This application Apr. 17, 1985, Ser. No. 723,011

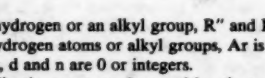
Int. Cl.[4] C07F 11/00

U.S. Cl. 534—14 9 Claims

1. A compound of the structure:



wherein each R' is independently a hydrogen atom, an alkyl group or X, and at least one of the groups R' is X, m is 0 or 1, Z is the anion of a strong mineral acid, b is an integer of 2 or greater and X has the formula:



where R is hydrogen or an alkyl group, R'' and R''' are independently hydrogen atoms or alkyl groups, Ar is an aromatic group, and a, d and n are 0 or integers.

9. A coordination compound comprising the technetium 1:1 complex of the compound set forth in claim 1.

4,638,052

AZO-PIGMENT CONTAINING HYDROXY NAPHTHOIC ACID AMIDE AND AN IMINOOXOISOINDOLENINE COMPONENTS

Kimihide Kawamura, Koshigaya; Shojiro Horiguchi, Omiya, and Hisao Okamoto, Washinomiya, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,900

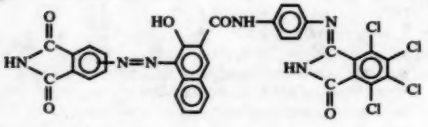
Claims priority, application Japan, Jan. 17, 1984, 59-4775; Jun. 18, 1984, 59-123627; Jun. 18, 1984, 59-123628; Jun. 18, 1984, 59-123629

Int. Cl.[4] C09B 29/036, 29/20, 29/22, 67/20

U.S. Cl. 534—575 4 Claims

1. An azo pigment represented by the formula:

(I')



4,638,053

PROCESS FOR THE PREPARATION OF CHLOROZINCATE SALTS OF BENZO THIAZOLIUM AZO DYESTUFFS BY ALKYLATING WITH DIALKYLSULFATE IN AQUEOUS MEDIUM IN THE PRESENCE OF ZN-CONTAINING ACID ACCEPTOR AT PH≦7

Rudolf Neeb, Obertshausen, and Reinhard Mohr, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Hoechstaktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 218,449, Dec. 19, 1980, abandoned, which is a continuation of Ser. No. 143,716, Mar. 29, 1978, abandoned, which is a continuation of Ser. No. 925,871, Jul. 18, 1978, abandoned. This application Sep. 11, 1985, Ser. No. 775,111

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733178

Int. Cl.[4] C09B 29/045, 43/11, 44/20

U.S. Cl. 534—589 8 Claims

1. In a process for the preparation of a chlorozincate salt of a benzothiazolium azo compound by treating a benzothiazole azo compound with a dialkylsulfate having of from 1 to 4 carbon atoms, in an aqueous medium at a temperature of from about 10° to 80° C., the improvement which comprises carrying out the alkylation with the use of 1.8 to 2.5 mols of the dialkylsulfate calculated on the starting azo compound, and in the presence of an acid acceptor consisting essentially of a zinc compound capable of binding an acid, at a pH not exceeding 7, and separating the tetrachlorozincate salt of the benzothiazolium azo compound formed by adding an alkali metal chloride.

4,638,054

AMINONAPHTHOL BISAZO REACTIVE DYES

Karl J. Herd, and Martin Michna, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,334

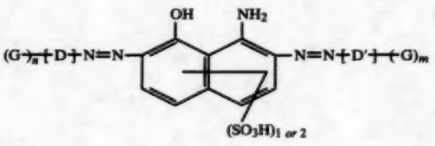
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340590

Int. Cl.[4] G09B 62/02, 62/022, 62/026, 62/03

U.S. Cl. 534—637 5 Claims

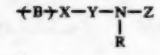
1. A reactive dyestuff of the formula

(I)



or their alkali metal salts, where

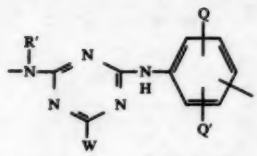
G is a radical of the formula



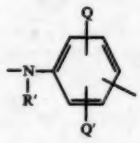
n and m are each 0 or 1 such that $n+m=1$ or 2,

D and D' are each a benzene, naphthalene or heterocyclic radical or a benzene, naphthalene or heterocyclic radical substituted by an azo-containing radical,

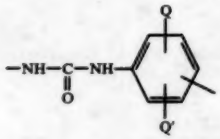
B is a direct bond between D or D' and X or a bridge member of the structure (2) to (5)



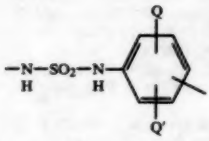
(2)



(3)



(4)



(5)

each of which is bonded with the amine function to a C atom of the ring system of D or D' and with the free bond of the phenyl system to X,

X is S, SO or SO_2,

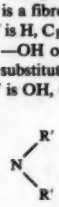
Y is C_1–C_6-alkylene unsubstituted or substituted by —OH, —SO_3H, —COOH or -halogen,

R is H, C_1–C_4-alkyl unsubstituted or substituted by —OH, —SO_3H, —COOH, -halogen or —OSO_3H,

Z is a fibre-reactive radical,

R' is H, C_1–C_4-alkyl which is unsubstituted or substituted by —OH or —COOH; or phenyl which is unsubstituted or substituted by —OH or —COOH,

W is OH, Cl, F, Br, SO_3H, NHR'



alkoxy, phenoxy and

Q and Q', independently of each other, are each H, OH, halogen, SO_3H COOH, C_1–C_4-alkyl or C_1–C_4-alkoxy.

4,638,055

IRON, COPPER AND CHROMIUM COMPLEXES OF DISAZO DYES

Udo Bergmann, Darmstadt; Guenter Hansen, Ludwigshafen, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

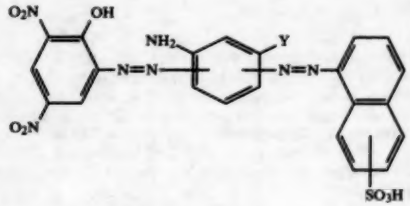
Continuation of Ser. No. 478,101, Mar. 23, 1983, Pat. No. 4,547,566. This application May 10, 1985, Ser. No. 721,712

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212240

Int. Cl.[4] C09B *45/26, 45/30, 45/32, 45/58*

U.S. Cl. 534—678 **4 Claims**

1. A metal complex selected from the group consisting of Fe, Co or Cr of the compound which in free acid form corresponds to the formula



(3)

wherein

Y is hydrogen or amino.

4,638,056

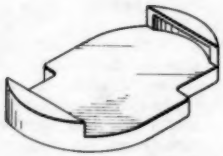
OPTHALMIC WAFER

Wayne B. Callahan, Milton; Harold O. Koch, Barboursville; Philip R. Palin, and James R. Cook, both of Huntington, all of W. Va., assignors to Cilco, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 516,341, Jul. 22, 1983, abandoned. This application Sep. 2, 1983, Ser. No. 528,857

Int. Cl.[4] A61F *2/16;* **C07H** *5/04, 5/10*

U.S. Cl. 536—54 **8 Claims**



1. A wafer of viscoelastic material adapted to hold an intraocular lens, wherein said viscoelastic material is chondroitin sulfate or a mixture of chondroitin sulfate and a hyaluronate.

4,638,057

CELLULOSE ACETATE MOLDING CONTAINING ODORIFEROUS SUBSTANCE

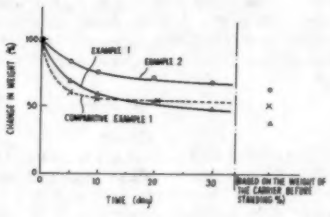
Shigeyuki Takahashi, Himeji; Manabu Uchida, and Kazuhiro Yamazaki, both of Hyogo, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Feb. 27, 1985, Ser. No. 706,219

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] C08B *3/06*

U.S. Cl. 536—76 **3 Claims**



1. Substantially spherical porous particles of celiulose acetate containing from about 50 to about 60% by weight of an odoriferous substance in the pores thereof, said cellulose acetate having a degree of acetylation of 50 to 58%, said particles

having a pore volume of at least 0.65 cc/g, a collapsing strength of at least 10 kg, a particle size of from 0.5 to 10.0 mm and a sphericity of at least 0.8.

4,638,058

ETHERS OF BETA-CYCLODEXTRIN AND A PROCESS FOR THEIR PREPARATION

Lothar Brandt, Wiesbaden, and Utz-Hellmuth Felcht, Bad Soden-Neuenhain, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 682,413

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345779

Int. Cl.[4] C08B *37/16*

U.S. Cl. 536—103 **16 Claims**

1. A mixture of water-soluble ethers of β-cyclodextrin having different degrees of substitution and wherein each substituent is the same and is either ethyl or an N,N-dialkyl(C_1 to C_4)amino ethyl group.

4,638,059

GEL-FORMING POLYSACCHARIDES

Ian W. Sutherland, Edinburgh, Scotland, assignor to National Research Development Corp., London, England

Filed Jun. 28, 1984, Ser. No. 625,548

Claims priority, application United Kingdom, Jul. 7, 1983, 8318403

Int. Cl.[4] C08B *37/00*

U.S. Cl. 536—121 **7 Claims**

1. A polysaccharide having the following features:

(1) it contains D-glucose, L-fucose and D-glucuronate residues in the approximate molar rtio of 3:1:1;

(2) when oxidized by periodate it gives a product containing D-glucose residues of the unoxidized polymer, substantially all the L-fucose residues of the unoxidized polymer and substantially no D-glucuronate;

(3) it forms gels when cations of at least any one of the elements lithium, sodium, potassium, rubidium and caesium opf Group Ia of the Periodic Table and magnesium, calcium, strontium and barium of Group IIa of the Periodic Table are added to an aqueous solution of the polymer;

(4) the gels thus formed melt at a temperature effective to melt the gel but ineffective to decompose it and set on cooling reversibly;

(5) the strength of the gels increases with increasing concentration of the polymer in aqueous solution;

(6) the polymer forms stronger gels with Group Ia and IIa cations of an ionic radus of about 0.1 nm than with other Group Ia and IIa cations of smaller or larger ionic radius and

(7) the polymer is obtainable by isolation from the bacterium NCIB 11870 or from a variant or mutant thereof.

3. A polysaccharide according to claim 1 wherein the gel formed by addition of 0.17 M aqueous sodium chloride solution to a 0.3% w/v (g/100 ml) aqueous solution of the polymer at ambient temperature has a yield stress at 25° C. of at least 10 g/cm^2.

4,638,060

O-SULFATED SPIRO β-LACTAM HYDROXAMIC ACIDS

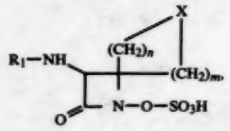
Joseph E. Sundeen, Yardley, Pa.; William H. Koster, East Amwell Township, Hunterdon County, and Robert Zahler, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 29, 1985, Ser. No. 728,432

Int. Cl.[4] C07D *205/08, 417/12, 495/10, 493/10*

U.S. Cl. 540—203 **6 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is acyl;

n and m are each independently 1, 2 or 3 and X is a saturated carbon bond; or n and m are each independently 1, 2 or 3, the sum of $n+m \leq 4$ and X is

and

R_2 is alkyl, aryl, hydroxy, alkoxy, alkanoyloxy, carbamoyloxy, alkanoylamino or ureido.

4,638,061

[3S(Z)]-2-[[[1-(2-AMINO-4-THIAZOLYL)-2-[[2,2-DIMETHYL-4-OXO-1-(SULFOOXY)-3-AZETIDINYL]AMINO]-2-OXOETHYLIDENE]-AMINO]OXY] ACETIC ACID AND INTERMEDIATE

William A. Slusarchyk, Belle Mead, and William H. Koster, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 28, 1985, Ser. No. 695,775

Int. Cl.[4] C07D *205/08, 403/12*

U.S. Cl. 540—355 **2 Claims**

1. The inner salt or a pharmaceutically acceptable basic salt of [3S(Z)]-2-[[[1-(2-amino-4-thiazolyl)-2-[[(2,2-dimethyl-4-oxo-1-(sulfooxy)-3-azetidinyl]amino]-2oxoethylidene]amino]oxy] acetic acid.

2. The compound (3S)-3-amino-2-oxo-4,4-dimethyl-1-azetidinylsulfate or a basic salt thereof.

4,638,062

3-ACYLAMINO-2-OXO-1-AZETIDINESULFONIC ACIDS

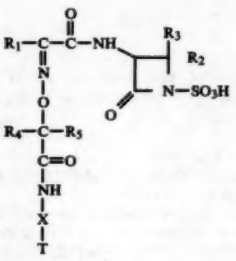
David Kronenthal, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 17, 1985, Ser. No. 745,467

Int. Cl.[4] C07D *205/08, 401/12, 403/12, 403/04*

U.S. Cl. 540—355 **15 Claims**

1. A compound having the formula

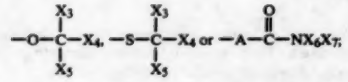


or a pharmaceutically acceptable salt thereof, wherein

R_1 is phenyl, substituted phenyl, 2-amino-4-thiazolyl, 5-amino-3-(1,2,4-thiadiazolyl), 2-amino-4-oxazolyl, 2-amino-4-imidazolyl, or 2-amino-6-pyridyl;

R_2 and R_3 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4, 5, 6 or 7-membered heterocycle or one of

R_2 and R_3 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $-CH_2X_1$, $-S-X_2$, $-O-X_2$,



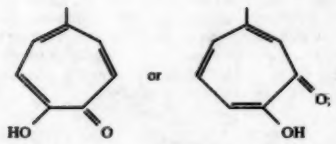
R_4 and R_5 are the same or different and each is hydrogen or alkyl, or R_4 and R_5 together with the carbon atom to which they are attached are cycloalkyl;

X is $-(CH_2)_n-$ wherein n is 0 or 1,

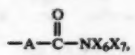
wherein the carbonyl group is bonded to the "T" group, or

wherein the carbonyl group is bonded to the "T" group;

T is



X_1 is azido, amino, hydroxy, carboxyl, alkoxycarbonyl, alkanoylamino, phenylcarbonylamino, (substituted phenyl)carbonylamino, alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



$-S-X_2$, or $-O-X_2$;

X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, (substituted phenyl)alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl;

one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group;

X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)-carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkyl-carbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano;

X_6 and X_7 are the same or different and each is hydrogen, alkyl, phenyl or substituted phenyl, or X_6 is hydrogen and X_7 is amino, substituted amino, alkanoylamino or alkoxy, or X_6 and X_7 when taken together with the nitrogen atom to which they are attached form a 4, 5, 6 or 7-membered heterocycle;

A is $-CH=CH-$, $-(CH_2)_m-$, $-(CH_2)_m-O-$, $-(CH_2)_m-NH-$ or $-CH_2-S-CH_2-$; and

m is 0, 1 or 2; and

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl, or alkylsulfonyl groups;

the terms "alkanoyl", "alkenyl" and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, alkanoyloxy, aminocarbonyl, or carboxy groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazoyl, triazinyl, tetrazolyl, azetidinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl, hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, 2-furfurylideneamino, benzylideneamino or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups; and

the term "substituted amino" refers to a group having the formula $-NX_8X_9$ wherein X_8 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and X_9 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy, or amino.

4,638,063

PROCESS FOR THE PREPARATION OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE 2,2-DIOXIDE AND ITS NON-TOXIC SALTS

Karl Clauss, Kelkheim; Adolf Linkies, Frankfurt am Main, and Dieter Reuschling, Butzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 714,175, Mar. 20, 1985, Pat. No. 4,563,521. This application Nov. 19, 1985, Ser. No. 799,622

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410440

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.[4] C07D 291/06

U.S. Cl. 544—2 **12 Claims**

1. A process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts, which comprises reacting acetoacetamide with at least approximately twice the molar amount of SO_3 in an inert inorganic or organic solvent.

4,638,064

PROCESS FOR PREPARING ETHYLENICALLY UNSATURATED HETEROCYCLIC THIOCARBONYL COMPOUNDS AND THEIR ORGANO-OXYLATED PRECURSORS

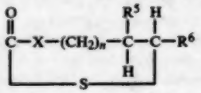
Pen-Chung Wang, Midland, Mich., and James M. Renga, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 1, 1985, Ser. No. 718,754

Int. Cl.[4] **C07D** *279/04, 277/04, 277/06, 327/02, 327/04, 327/06, 333/22, 333/24, 335/02, 333/16, 337/04, 339/02, 339/08*

U.S. Cl. 544—54 **13 Claims**

1. A process for forming oxylated derivatives of heterocyclic thiocarbonyl compounds comprising the step of contacting a heterocyclic precursor represented by the following formula



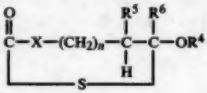
in which

X is selected from the group of bivalent moieties O, S, CR^7R^8 and NR^9;

R^5, R^6, R^7, R^8 and R^9 are independently selected from the group of monovalent moieties hydrogen, lower alkyl, aryl and acyl; and

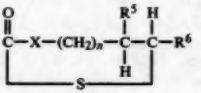
n is between 0 and about 15;

with an oxylating agent which is represented by the formula $R^4OM_{1/y}$ in which R^4 is alkyl or acyl and M is either hydrogen or a metal cation of charge y under anodic alkoxylation or acyloxylation conditions sufficient to form an oxylated derivative represented by the formula:



in which X, R^4, R^5, R^6 and n are as previously defined.

10. A process for producing a mono-unsaturated heterocyclic thiocarbonyl which comprises (1) contacting a heterocyclic precursor represented by the following formula



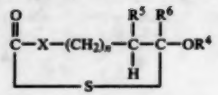
in which

X is selected from the group of bivalent moieties O, S, CR^7R^8 and NR^9;

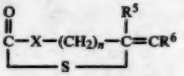
R^5, R^6, R^7, R^8 and R^9 are independently selected from the group of monovalent moieties hydrogen, lower alkyl, aryl and acyl; and

n is between 0 and about 15;

with an oxylating agent which is represented by the formula $R^4OM_{1/y}$ in which R^4 is alkyl or acyl and M is either hydrogen or a metal cation of charge y under anodic alkoxylation or acyloxylation conditions sufficient to form an oxylated derivative represented by the formula:



in which X, R^4, R^5, R^6 and n are as previously defined and (2) dehydroxylating by heating the oxylated derivative to produce a compound represented by the following formula:



in which X is selected from the group of bivalent moieties O, S, CR^7R^8 and NR^9; R^5 and R^6 are independently selected from the group of monovalent moieties hydrogen, lower alkyl, aryl and acyl; and n is between 0 and about 15.

4,638,065

CRYSTALLIZATION METHOD FOR HMX AND RDX

Leif Svensson; Jan-Olof Nyqvist, both of Karlskoga, and Lars Westling, Stengungsund, all of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 26, 1985, Ser. No. 716,066

Claims priority, application Sweden, Apr. 4, 1984, 8401857

Int. Cl.[4] **C07D** *251/59, 225/02*

U.S. Cl. 544—196 **10 Claims**

1. A process for recrystallizing the high explosives HMX and RDX, in which crystals of the starting explosive are dissolved in a low molecular weight, liquid (at room temperature) lactone with 5 or 6 carbon atoms in the ring, after which the degree of saturation of the solution obtained is changed in order to form new crystals of the explosive.

4,638,066

INDENO PYRAZINE AND BENZOQUINOXALINE INTERMEDIATES

Laramie M. Gaster, Bishop's Stortford, and Barry S. Orlek, London, both of England, assignors to Beecham Group p.l.c., Epsom, England

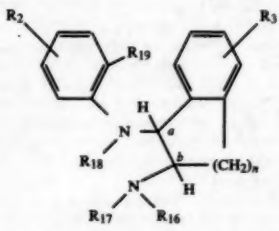
Division of Ser. No. 472,218, Mar. 4, 1983, Pat. No. 4,504,480. This application Dec. 20, 1984, Ser. No. 684,080

Claims priority, application United Kingdom, Mar. 5, 1982, 8206558

Int. Cl.[4] **C07D** *241/38, 241/44, 241/42, 401/06*

U.S. Cl. 544—344 **2 Claims**

1. A compound of formula (XXVI):



(XXVI)

wherein R_2 and R_3 are the same or different and are hydrogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, halogen or trifluoromethyl, and n is 1 or 2, the hydrogen atom bonded to the C_a carbon atom being trans to the hydrogen atom bonded to the C_b carbon atom and either R_{16} is hydrogen, C_{1-7} alkyl, C_{3-7} cycloalkyl, C_{4-7} cycloalkenyl or C_{1-4} alkyl substituted by C_{2-7} alkenyl, C_{2-7} alkynyl, C_{3-7} cycloalkyl, hydroxy, thiol, C_{1-4} alkoxy, C_{1-4} alkylthio, carboxy, C_{1-4} alkoxycarbonyl, C_{1-4}

alkanoyl, amino optionally substituted by one or two C_{1-4} alkyl or by C_{4-6} polymethylene optionally interrupted by an oxygen atom or by NH, aminocarbonyl optionally N-substituted by one or two C_{1-4} alkyl, or benzoyl or phenyl either being optionally ring-substituted by C_{1-4} alkyl, C_{1-4} alkoxy, halogen or trifluoromethyl, or C_{1-4} alkoxycarbonyl, phenoxycarbonyl or benzyloxycarbonyl and R_{17} and R_{18} together are either ethylene or $(CO)_{s'}—(CH_2)_{t'}—(CO)_{u'}$ wherein s' and u' and 0 or 1 and t' is 0 to 2 such that s'+t'+u' is 2; and R_{19} is G wherein G is formyl, carboxy or a C_{1-4} alkyl ester thereof or is CH_2L_1, wherein L_1 is selected from the group consisting of hydroxy, bromo, chloro, C_{1-4} alkoxy, C_{1-4} alkanoyloxy, C_{1-4} alkoxycarbonyloxy, tosyloxy or mesyloxy.

4,638,067

ANTIBACTERIAL AGENTS

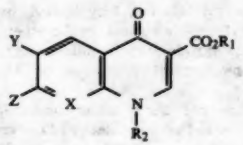
Townley P. Culbertson, Ann Arbor; John M. Domagala, Canton; Thomas F. Mich, Ann Arbor, and Jeffrey B. Nichols, Ypsilanti, all of Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

Division of Ser. No. 692,820, Jan. 23, 1985, which is a continuation-in-part of Ser. No. 581,157, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 522,275, Aug. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 416,406, Sep. 9, 1982, abandoned. This application Aug. 12, 1985, Ser. No. 764,357

Int. Cl.[4] C07D *471/04, 401/14, 215/02*

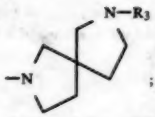
U.S. Cl. 546—15 **8 Claims**

1. A compound of the formula



wherein

Z is



X is CH, CCl, CF, CO-alkyl having from one to three carbon atoms, C—NH—alkyl having from one to three carbon atoms or N;

Y is hydrogen, fluorine, chlorine, or bromine;

R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation;

R_2 is alkyl having from one to four carbon atoms, vinyl, haloalkyl, or hydroxyalkyl having from two to four carbon atoms or cycloalkyl ahving three to six carbon atoms;

R_3 is hydrogen, alkyl having from one to four carbon atom or cycloalkyl having three to six carbon atoms

or a pharmaceutically acceptable acid addition or base salt thereof.

4,638,068

2-(2-IMIDAZOLIN-2-YL)-PYRIDINES AND QUINOLINES, PROCESS AND INTERMEDIATES FOR THE PREPARATION THEREOF, AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

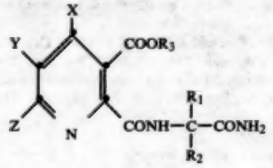
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 252,704, Apr. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 155,909, Jun. 2, 1980, abandoned, Ser. No. 155,910, Jun. 2, 1980, abandoned, Ser. No. 155,867, Jun. 2, 1980, abandoned, Ser. No. 155,908, Jun. 2, 1980, abandoned, and Ser. No. 155,865, Jun. 2, 1980, abandoned. This application May 25, 1982, Ser. No. 382,041

Int. Cl.[4] C07D *213/56, 215/14, 221/04*

U.S. Cl. 546—169 **8 Claims**

1. A compound having the structure:

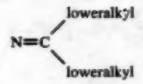


wherein

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may represent C_3–C_6 cycloalkyl optionally substituted with methyl;

R_3 is hydrogen,



C_1–C_{12} alkyl optionally substituted with one of of the following groups: C_1–C_3 alkoxy, halogen, hydroxyl, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, halophenyl, loweralkylphenyl, loweralkoxyphenyl, nitrophenyl, carboxyl, loweralkoxycarbonyl, cyano or triloweralkylammonium halide;

C_3–C_{12} alkenyl optionally substituted with one of the following groups: C_1–C_3 alkoxy, phenyl, halogen or loweralkoxycarbonyl or with two C_1–C_3 alkoxy groups or two halogen groups;

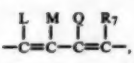
C_3–C_6 cycloalkyl optionally substituted with one or two C_1–C_3 alkyl groups;

C_3–C_{16} alkynyl; or,

A cation;

X is hydrogen, halogen, hydroxyl or methyl, with the proviso that when Y and Z are taken together to form a ring and YZ is represented by the structure: $—(CH_2)_n—$, where n is 3 or 4, X is hydrogen;

Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, hydroxyloweralkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, nitro, cyano, C_1–C_4 alkylamino, diloweralkylamino or C_1–C_4 alkylsulfonyl group, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and, when taken together, Y and Z may form a ring in which YZ are represented by the structure: $—(CH_2)_n—$, where n is an integer of 3 or 4, provided that X is hydrogen; or



where L, M, Q and R_7 are each hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, C_1–C_4 alkylamino, diloweralkylamino, chlorophenyl, methylphenyl, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, Q or R_7 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

and the N-oxides thereof provided that in the N-oxidase Y and Z cannot be aklkylamino, dialkylamino or alkylthio; and when R_1 and R_2 represent different substituents, the optical isomers thereof.

4,638,069

ISOCYANIC ACID-PHENYL ESTER PYRIDINE DERIVATIVES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

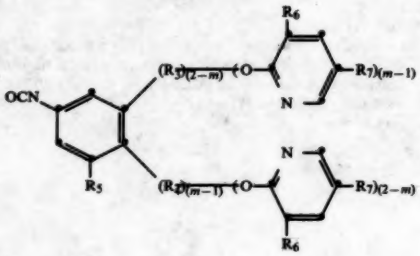
Division of Ser. No. 639,039, Aug. 9, 1984, Pat. No. 4,550,108. This application May 17, 1985, Ser. No. 734,989

Claims priority, application Switzerland, Aug. 17, 1983, 4487/83; Apr. 13, 1984, 1861/84; Jul. 13, 1984, 3424/84

Int. Cl.[4] C07D *211/04*

U.S. Cl. 546—300 **9 Claims**

1. A compound of the formula



wherein

R_3 and R_4 are each hydrogen, halogen or C_1–C_4-alkyl,

R_5 is hydrogen, halogen, C_1–C_4-alkyl or —$COOR_8$,

R_6 is hydrogen or halogen,

R_7 is mono- or polyhalogenated C_1–C_4-alkyl,

R_8 is hydrogen or C_1–C_4-alkyl, and

m is 1 or 2.

4,638,070

HETEROCYCLIC AMINO-ALCOHOL DERIVATIVES

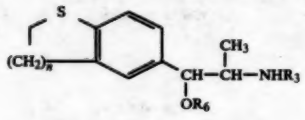
Georges E. Lambelin, Brussels; Roméo R. Roncucci, Rosières-St-André ; Joseph Roba, Waulin, and Claude L. Gillet, Brussels, all of Belgium, assignors to Continental Pharma, Brussels, Belgium

Continuation of Ser. No. 971,715, Dec. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 742,917, Nov. 17, 1976, abandoned. This application Jun. 30, 1980, Ser. No. 164,326

Int. Cl.[4] C07D *337/00, 327/06, 333/52, 335/04*

U.S. Cl. 549—23 **4 Claims**

1. Amino-alcohol derivative having the formula:



wherein:

R_3 is a linear or branched alkyl radical (C_6–C_{10}) or a linear or branched alkyl group (C_2–C_3) substituted by a phenoxy or a phenylthio radical or a linear or branched alkyl group (C_3–C_4) substituted by a phenyl or a benzoyl radical; said phenoxy, phenylthio, phenyl and benzoyl radicals can be substituted by a halogen or a methyl,

R_6 is hydrogen or a linear or branched alkanoyl(C_1–C_4) radical or a cycloalkanoyl(C_3–C_6) radical, and

n is equal to 1,2 or 3.

4,638,071

CYCLOALKYL ETHERS AND THIOETHERS OF DIPEPTIDES

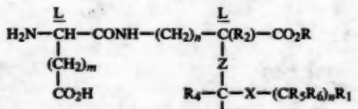
Ronald E. Barnett, Suffern; Paul R. Zanno, Nanuet, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,577

Int. Cl.[4] C07D *331/04, 327/02, 315/00, 307/02; C07C 69/74*

U.S. Cl. 549—88 **82 Claims**

1. A compound represented by the formula:



wherein

R is alkyl containing 1–3 carbon atoms;

when X=S

R_1 is cycloalkyl, cycloalkenyl, lower alkyl-substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bycycloalkenyl, tricycloalkyl, aryl, alkylaryl, cyclic ether, cyclic thioether, cyclic sulfoxide or cyclic sulfone, containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

when X=O

R_1 is cyclic ether or cyclic thioether containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2, R_3, R_4 and R_6 are each H or lower alkyl;

R_5 is H, lower alkyl or cycloalkyl containing up to 3–5 ring carbon atoms;

each n=0, 1 or 2;

m=0 or 1;

Z is an alkylene chain containing 0–2 carbon atoms in the principal chain and up to a total of 6 carbon atoms;

and food acceptable salts.

4,638,072

DISUBSTITUTED MALEIC ANHYDRIDE COMPOUNDS

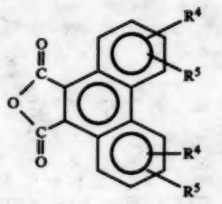
Ellis K. Fields, River Forest; Mark L. Winzenburg, Naperville, and Steven J. Behrend, Glendale Heights, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 630,361, Jul. 12, 1984, Pat. No. 4,596,867. This application Dec. 11, 1985, Ser. No. 807,677

Int. Cl.[4] C07D *307/77, 493/04*

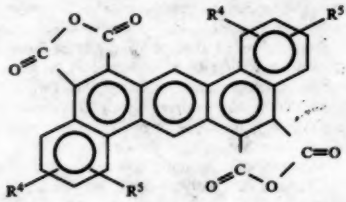
U.S. Cl. 549—234 **3 Claims**

1. A substituted phenanthrene anhydride compound of the structural formula



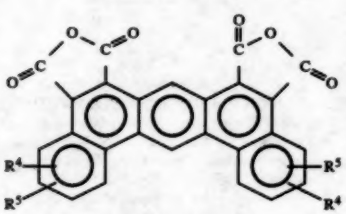
wherein R^4 and R^5 are individually selected from the group consisting of $—NH_2$ and $—CH=CH_2$.

2. A substituted dibenzanthracene dianhydride compound of the structural formula



wherein R^4 and R^5 are individually selected from the group consisting of hydrogen, alkyl moieties of 1 to 10 carbon atoms, phenyl moieties, naphthyl moieties, $—NO_2$, $—NHCOCH_3$, $—NH_2$, $—OCOCH_3$, —OH, $—OCH_3$, $—CH=CH_2$, $—COOCH_3$ and —COOH.

3. A substituted dibenzanthracene dianhydride compound of the structural formula



wherein R^4 and R^5 are individually selected from the group consisting of hydrogen, alkyl moieties of 1 to 5 carbon atoms, phenyl moieties, naphthyl moieties, $—NO_2$, $—NHCOCH_3$, $—NH_2$, $—OCOCH_3$, —OH, $—OCH_3$, $—CH=CH_2$, $—COOCH_3$, and —COOH.

4,638,073

SYNTHESIS OF NEW LIQUID CRYSTAL MATERIALS POSSESSING PHENYLBENZOATE OR BIPHENYL CORE UNITS AND (2,3)-EPOXYALKYLOXIRANEMETHANOL CHIRAL TAILS

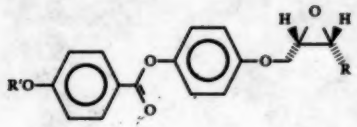
David M. Walba, 3199 Westwood Ct., Boulder, Colo. 80302, and Rohini Vohra, 3877 Arbol Ct., Boulder, Colo. 80301

Filed Oct. 1, 1985, Ser. No. 782,348

Int. Cl.[4] C07D *303/16, 303/18;* C09K *19/34, 19/20*

U.S. Cl. 549—556 **25 Claims**

1. A compound of formula:



wherein R is an alkyl of one to seven carbon atoms, and R′ is an alkyl of five to twelve carbon atoms.

4,638,074

EXTRACTION OF TIN FROM ITS ORES

Frank S. Holland, Stockport, England, assignor to Manchem Limited, Manchester, England

Filed Jan. 14, 1986, Ser. No. 818,760

Claims priority, application United Kingdom, Jan. 18, 1985, 8501249

Int. Cl.[4] C07F *7/22*

U.S. Cl. 556—98 **14 Claims**

1. A process for the direct recovery of tin from reduced but unrefined tin ores and ore slags of a tin content of at most about 70 wt % which consists essentially in

forming a comminuted, reduced but unrefined tin ore of fine particles;

treating said unrefined tin ore with a hydrocarbyl halide to form an organo hydrocarbyl tin compound; and

separating said organo hydrocarbyl tin compound from the tin-depleted solid ore residues.

4,638,075

HERBICIDAL SULFONAMIDES

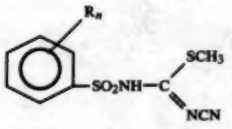
William A. Kleschick, Martinez; Anna P. Vinogradoff, Concord, both of Calif., and Joseph E. Dunbar, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 691,331, Jan. 14, 1985. This application Dec. 23, 1985, Ser. No. 812,612

Int. Cl.[4] C07C *157/14;* C07D *333/38, 333/32, 487/00*

U.S. Cl. 558—5 **1 Claim**

1. A compound having the formula



wherein each R individually represents hydrogen, halo, nitro, C_1–C_4 alkyl or alkoxy or C_1–C_2 mono- or polyfluoroalkyl or alkoxy and n is an integer from 0 to 5.

4,638,076

PHOSPHORAMIDE ADDITIVES FOR PREPARATION OF ORGANIC CARBONATES

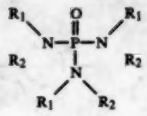
Ajit K. Bhattacharya, Hopewell Junction, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,325

Int. Cl.[4] C07C *68/00*

U.S. Cl. 558—277 **9 Claims**

1. A method of preparing dimethyl carbonate which comprises reacting methanol (CH_3OH) with carbon monoxide (CO) and oxygen (O_2) in the presence of a catalyst system containing as a catalyst cupric methoxychloride Cu(OMe)Cl, and as an additive for the catalyst a phosphoramide of the formula



where R_1 and R_2 are (C_1–C_8) alkyl, alkylene or oxa-, thia-, aza-alkylene groups; and recovering the organic carbonate product.

4,638,077

METHOD FOR THE PREPARATION OF CHLOROFORMATE COMPOSITIONS

Daniel J. Brunelle, Scotia; Thomas G. Shannon, Schenectady, both of N.Y., and Niles R. Rosenquist, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 676,353, Nov. 29, 1984. This application Oct. 24, 1985, Ser. No. 790,909

Int. Cl.[4] C01B *31/24*

U.S. Cl. 558—281 **10 Claims**

1. A method for preparing chloroformate compositions which comprises passing phosgene into a heterogeneous mixture of a substantially inert organic liquid and a hydroxy compound of the formula

$$R^2(OH)_x \qquad \text{(III)}$$

wherein R^2 is an aliphatic or alicyclic radical free from acetylenic unsaturation or an aromatic radical and x is at least 1, said mixture being maintained at a temperature within the range of about 10°–40° C., with the proviso that the phosgene addition rate is high enough to effect rapid and complete reaction of phosgene with dissolved hydroxy compound when x is greater than 1 and the temperature is above 30° C., and simultaneously introducing a hydrogen chloride scavenger comprising an aqueous alkali metal or alkaline earth metal hydroxide solution as necessary while maintaining a pH in the range of 0.5–8 in the aqueous phase; the ratio of equivalents of total phosgene used to hydroxy compound being about 1.0–1.1:1.

4,638,078

ARYLCYCLOBUTENYL AMIDO ALKENOIC ACIDS AND SALTS THEREOF

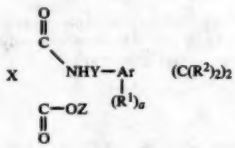
Robert A. Kirchhoff, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 25, 1985, Ser. No. 727,162

Int. Cl.[4] C07C *121/64, 103/34*

U.S. Cl. 558—414 **19 Claims**

10. A compound which corresponds to the formula



wherein

Ar is an aromatic radical;

R^1 is separately in each occurrence a hydrocarbyl, hydrocarbyloxy, hydrocarbylthio, electron-donating or electron-withdrawing group;

R^2 is separately in each occurrence hydrogen or an electron-withdrawing group;

X is an alkenylene moiety which can be substituted with one or more hydrocarbyl, hydrocarbyloxy or hydrocarbylthio groups;

Y is a direct bond or divalent organic moiety;

Z is hydrogen or a cation derived from ammonia, a primary or secondary amine, an alkali metal base or alkaline earth metal base; and

a is an integer of between about 0 and 3.

4,638,079

INHIBITING POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Ervin B. Inskip, Troy, Ill., and Joseph M. Patane, Manchester, Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jan. 17, 1985, Ser. No. 692,080

Int. Cl.[4] C07C *67/62, 51/50*

U.S. Cl. 560—4 **25 Claims**

1. A process for inhibiting polymerization of a polymerizable ethylenically unsaturated acid monomer, which comprises admixing therewith per 100 parts by weight of the monomer 0.001–0.5 part by weight of at least one metal complex of N-nitrosophenylhydroxylamine having the formula MA_n where M is a cation selected from cobalt (III), nickel (II) and manganese (II), A is the anion of N-nitrosophenylhydroxylamine and n is a number equal to the valence of M.

9. A process of inhibiting polymerization in the substantial absence of oxygen of a polymerizable ethylenically unsaturated ester monomer, which comprises admixing with said monomer per 100 parts by weight of the monomer 0.001–0.5 part by weight of at least one metal complex of N-nitrosophenylhydroxylamine having the formula MA_n where M is the cobalt (III) cation, A is the anion of N-nitrosophenylhydroxylamine and n is 3.

4,638,080

PREPARATION OF DIPHENYLAZOMETHINES

Bernard Raizon, Vigneux; Guy Rossey, Montigny-Le-Bretonneux, and Alexander Wick, St Nom-De-Breteche, all of France, assignors to Synthelabo, Paris, France

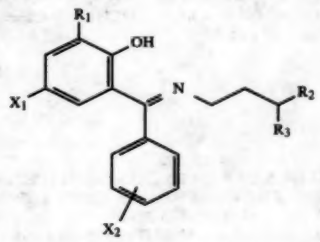
Filed Feb. 25, 1986, Ser. No. 832,690

Claims priority, application France, Feb. 26, 1985, 85 02724

Int. Cl.[4] C07C *101/72*

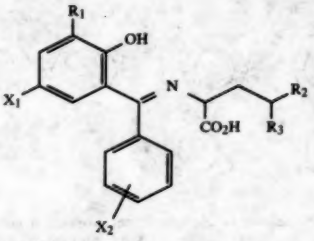
U.S. Cl. 560—35 **2 Claims**

1. A process for preparing a compound of formula (II)



(II)

wherein X_1 and X_2 are the same or different and each is hydrogen, halogen or methyl; R_1 is hydrogen or straight or branched (C_{1-4})alkyl; R_2 is —COOH, straight or branched (C_{1-4})alkyl, —$CONH_2$ or straight or branched —$COO(C_{1-4})$alkyl and R_3 is hydrogen or methyl, comprising decarboxylating a compound of formula (I)



(I)

wherein X_1, X_2, R_1, R_2 and R_3 are as defined above.

4,638,081

PROCESS FOR PREPARING α-ASPARTYL-L-PHENYLALANINE METHYL ESTER

Biagio Elefante, Gorgonzola, Italy, assignor to DE-BI Derivati Biologici International SpA, Milan, Italy

Filed May 10, 1984, Ser. No. 608,983
Claims priority, application Italy, May 13, 1983, 21080 A/83
Int. Cl.[4] C07C *101/32*; C07K *5/06*
U.S. Cl. 560—40 11 Claims

1. A process for preparing α-aspartyl-L-phenylalanine methyl ester from N-formyl-L-aspartic anhydride and L-phenylalanine methyl ester, while simultaneously increasing the relative production of the α isomer over the β isomer, comprising:

(a) contacting N-formyl-L-aspartic anhydride and L-phenylalanine methyl eter, in a molar ratio of about 1:1, with a solid cation exchange resin having free sulphonic, phosphonic or carboxylic acid groups, the ratio of the acid equivalents of said resin acid groups to the number of moles of the one or the other of said reagents being from about 0.05:1 to about 1:1, and operating in the liquid phase in an inert organic solvent at a temperature of about −15° C. to about 40° C. for a period of about 5 minutes to about 2 hours, until a mixture of N-formyl-α-L-aspartyl-L-phenylalanine methyl ester and N-formyl-β-L-aspartyl-L-phenylalanine methyl ester forms;

(b) deformylating said N-formyl-α-L-aspartyl-L-phenylalanine methyl ester and N-formyl-β-L-aspartyl-L-phenylalanine methyl ester; and

(c) separating and recovering the α-L-aspartyl-L-phenylalanine methyl ester from said deformylated products.

4,638,082

METHOD OF PRODUCING THE P-CHLOROPHENOL ESTER OF P-CHLOROPHENOXYISOBUTYRIC ACID

Claude Feniou, Pessac, and Patrick Descas, Bordeaux, both of France, assignors to Societe Corial, S.A., Paris, France

Filed Feb. 25, 1986, Ser. No. 832,688
Claims priority, application France, Feb. 28, 1985, 85 03094
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—62 15 Claims

1. A method for the preparation of the p-chlorophenol ester of p-chlorophenoxyisobutyric acid, comprising:

(i) converting p-chlorophenol to a salt in the presence of a non-polar solvent, and

(ii) reacting the said salt of p-chlorophenol with an acyl halide derivative of a haloisobutyric acid, wherein at least 2 moles of the said salt of p-chlorophenol are used per mole of the said haloisobutyric acid.

4,638,083

ETHYNYL TERMINATED ESTER OLIGOMERS AND POLYMERS THEREFROM

Paul M. Hergenrother, Yorktown, and Stephen J. Havens, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Division of Ser. No. 613,138, May 23, 1984, Pat. No. 4,567,240.
This application Jul. 31, 1985, Ser. No. 760,797
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—104 2 Claims

1. A method of preparing 2-2-bis(4-ethynylbenzoyloxy-4'-phenyl)propane comprising:

adding 4-ethynylbenzoyl chloride to a stirred solution of 2,2-bis(4-hydroxyphenyl)propane in dry pridine,

stirring this mixture approximately twelve hours and precipitating the mixture in a 5% solution of hydrochloric acid,

combining the solid precipitate with a 10% sodium bicarbonate solution,

collecting the solid by filtration and air drying the recovered solid,

recrystallization the solid from a 80/20 ethanol/chloroform mixture to recover light yellow needle crystals of 2,2-bis(4-ethynylbenzoyloxy-4-phenyl)propane.

4,638,084

PROCESS FOR DIMERIZING ACRYLATES AND METHACRYLATES

David M. Singleton, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 12, 1985, Ser. No. 775,077
Int. Cl.[4] C07C *67/343*
U.S. Cl. 560—202 7 Claims

1. A catalytic dimerization process comprising contacting, at about 0° C. to about 150° C., a lower alkyl acrylate or lower alkyl methacrylate with lower alkyl being alkyl of 1 to 8 carbon atoms with a catalyst prepared by reacting chlorobis(ethylene)rhodium(I)dimer and silver tetrafluoroborate in a mole ratio of dimer to tetrafluoroborate of about 0.5:1 and wherein the ratio of moles of acrylate or methacrylate to gram atoms of rhodium ranges from about 10:1 to about 10000:1.

4,638,085

PREPARATION OF METHYL METHACRYLATE FROM METHACROLEIN

Franz J. Broecker, Ludwigshafen; Gerd Duembgen, Dannstadt-Schauernheim; Gerd Fouquet, Neustadt; Richard Krabetz, Kirchheim; Franz Merger, Frankenthal, and Friedbert Nees, Stutensee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 473,601, Mar. 9, 1983, abandoned. This application Nov. 21, 1984, Ser. No. 660,978
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210708
Int. Cl.[4] C07C *67/39*
U.S. Cl. 560—208 2 Claims

1. A process for the preparation of methyl methacrylate by reacting methacrolein, methanol and oxygen at from 20° to 100° C. over a catalyst for the preparation of carboxylic acid esters from aldehydes and alcohols in the presence of oxygen, said catalyst containing palladium and lead as active constituents, wherein

(a) the active constituents are supported on a carrier which contains two or more of oxides selected from the group consisting of ZnO, Al_2O_3, La_2O_3 and TiO_2, and

(b) said catalyst is free from alkali metal compounds and alkaline earth metal compounds.

4,638,086

PROCESS FOR THE RACEMIZATION OF OPTICALLY ACTIVE AMINOACIDS

Susanne Grabley, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,266
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 3334849
Int. Cl.[4] C07B 55/00
U.S. Cl. 562—401 10 Claims

1. A process for racemization of optically active amino acids which comprises heating said amino acids with an effective amount of benzoic or phenylacetic acid or their derivatives which are monosubstituted or polysubstituted on the nucleus by identical or different substituents selected from the group consisting of halogen, lower alkyl, lower alkoxy, hydroxy, acyloxy, and nitro.

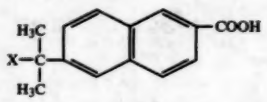
4,638,087

6-SUBSTITUTED NAPHTHALENE-2-CARBOXYLIC ACIDS AND PROCESS FOR PRODUCING THE SAME

Akira Iizuka; Yutaka Konai; Takashi Yamauchi, and Shoichiro Hayashi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,525
Int. Cl.[4] C07C 63/34
U.S. Cl. 562—467 8 Claims

1. 6-substituted naphthalene-2-carboxylic acids represented by the formula (I):



(I)

wherein X represents a hydroperoxy group or a hydroxy group.

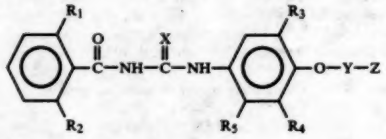
4,638,088

PESTICIDAL BIPHENYLYLOXY AND BIPHENYLYLALKOXY ARYL ACYL UREA COMPOUNDS

David T. Chou, and Robert C. Ligon, both of Raleigh, N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 15, 1984, Ser. No. 672,007
Int. Cl.[4] C07C 127/22, 157/12, 143/833, 149/40
U.S. Cl. 564—23 22 Claims

1. A compound of the formula:



wherein:

R_1 is halogen, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy or nitro;

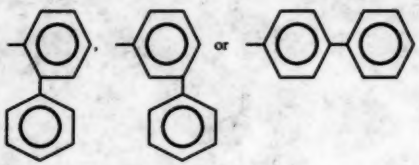
R_2 is hydrogen, halogen, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy or nitro;

R_3, R_4, and R_5 are independently hydrogen, halogen, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy, nitro, cyano, carboxylic acid, carboxylic acid salt or carboxylic acid ester;

X is oxygen or sulfur;

Y is C_{1-8} alkylene or a covalent bond; and

Z is substituted or unsubstituted



wherein the permissible substituents are one or more halo, C_{1-6} alkyl, alkoxy, polyhaloalkyl, polyhaloalkoxy, nitro, cyano, carboxylic acid, carboxylic acid salt or carboxylic acid ester substituents which may be the same or different.

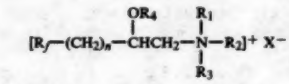
4,638,089

FLUORINE-CONTAINING QUATERNARY AMMONIUM COMPOUNDS AND THEIR PRODUCTION

Iwao Hisamoto, Osaka; Chiaki Maeda, Kyoto, and Mitsuhiro Nishiwaki, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 24, 1981, Ser. No. 257,194
Claims priority, application Japan, Apr. 26, 1980, 55-56049
Int. Cl.[4] C07C 91/26
U.S. Cl. 564—292 10 Claims

1. A fluorine-containing quaternary ammonium compound of the formula:



wherein R_f is a fluorine-containing aliphatic hydrocarbon or polyether group, R_1, R_2 and R_3 are each an alkyl, hydroxyalkyl alkenyl group aryl or aralkyl group, R_4 is a hydrogen atom or an acyl group, X^- is an anion and n is an integer of 1 to 3.

4,638,090

PROCESSES FOR THE PREPARATION OF NITROSAMINE-FREE N,N-DISUBSTITUTED NITROAROMATIC AMINES AND FOR THE STABILIZATION OF THESE COMPOUNDS AGAINST THE FORMATION OF NITROSAMINES

Rüdolf Heinrich, and Konrad Albrecht, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschat, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 12, 1984, Ser. No. 680,750
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345157
Int. Cl.[4] C07C 85/26
U.S. Cl. 564—437 10 Claims

1. A process for stabilizing a N,N-disubstituted dinitroaniline compound against the formation of a nitrosamine, which comprises adding an aromatic sulfonic acid with up to 18 carbon atoms to a molten N,N-disubstituted dinitroamiline compound in an amount up to 1% by weight based on the amiline.

4,638,091

CHEMICAL PROCESS

Roy D. Bowden, Warrington, England, assignor to Imperial Chemical Industries PLC, London, England

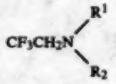
Filed Feb. 11, 1985, Ser. No. 700,384

Claims priority, application United Kingdom, Feb. 17, 1984, 8404225

Int. Cl.[4] C07C 85/08, 45/00

U.S. Cl. 564—473 5 Claims

1. A method for the preparation of a fluorinated amine of the formula:



wherein each of R^1 and R^2, independently, represents hydrogen or lower alkyl, which comprises the steps of

(a) reacting trichloroacetaldehyde with hydrogen flouride at an elevated temperature in the presence of a fluorination catalyst to form trifluoroacetadehyde,

(b) dissolving the trifluoroacetaldehyde in an aqueous medium, and

(c) contacting the aqueous solution of trifluoroacetaldehyde with a nitrogenous base of the formula:

and hydrogen in the presence of a hydrogenation catalyst.

4,638,092

NEW ORGANIC BORON POLYMERS AND THEIR USE

Wolfgang Ritter, Düsseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 407,886, Aug. 13, 1982, abandoned. This application May 29, 1985, Ser. No. 738,902

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1982, 3201780

Int. Cl.[4] C07F 5/02

U.S. Cl. 568—1 20 Claims

1. An organo-boron compound having a boron-free polymer matrix having at least one organic polymer chain to which are attached as side chains boron-containing groups in which the boron atoms are attached only to carbon atoms, wherein the boron-containing groups are attached to the polymer matrix through the boron atom, and wherein the boron-containing groups have either two hydrocarbon radicals in which the radicals are the same or different and each radical has up to 25 carbon atoms, or a cyclic hydrocarbon radical having up to 25 carbon atoms each end of which is bound to the boron atom with a boron-carbon bond, said boron-free polymer matrix being largely inert to atmospheric oxygen and having an iodine number from about 1 to about 500 before attachment of the boron-containing groups, said organo-boron compound being in the form of a viscous fluid to a solid mass that is largely free of solvents.

4,638,093

PREPARATION OF SECONDARY THIOLS

Herbert E. Fried, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 484,051, Apr. 11, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 718,912

Int. Cl.[4] C07C 149/06

U.S. Cl. 568—73 10 Claims

1. A process for the preparation of C_{10} to C_{22} secondary thiols in enhanced selectivity which comprises contacting in a liquid phase at a temperature in the range from about 50° to 100° C. and at a pressure in the range from about 400 to about 1500 psig, one or more C_{10} to C_{22} linear mono-olefins with hydrogen sulfide, the molar ratio of said hydrogen sulfide to said olefins in said liquid phase being at least about 10.0 to 1, in the presence of a catalytically effective amount of a decationized or cation exchanged Type Y zeolite catalyst.

4,638,094

PROCESS FOR PRODUCING PHENYLACETONES

Mamoru Nakai, and Takuji Enomiya, both of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

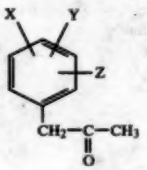
Filed Jul. 29, 1983, Ser. No. 518,691

Claims priority, application Japan, Aug. 6, 1982, 57-136346; Aug. 10, 1982, 57-138024; Dec. 7, 1982, 57-213324; Jan. 11, 1983, 58-001744; Jan. 13, 1983, 58-002854; May 26, 1983, 58-091474; Jun. 6, 1983, 58-099579; Jun. 9, 1983, 58-101665

Int. Cl.[4] C07C 45/00

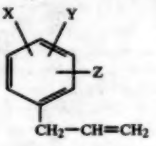
U.S. Cl. 568—309 16 Claims

1. A process for producing a phenylacetone or its derivative having the general formula (I):



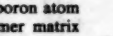
(I)

wherein X, Y, and Z are independently a hydrogen atom, a hydroxyl group, a halogen atom, a nitro group, an amino group, a lower alkyl group having 1 to 6 carbon atoms, a lower alkoxy group having 1 to 6 carbon atoms, or a benzyloxy group, and any two substituents of X, Y, and Z may form, together with the benzene ring, a heterocyclic ring having 5 to 7 members including 1 or 2 oxygen atoms comprising the step of reacting a 3-phenylpropylene or its derivative having the general formula (II):



(II)

wherein X, Y, and Z are as defined above, with an alkyl nitrite having the general formula (III):



(III)

wherein R is an aliphatic, aromatic, or alicyclic saturated or unsaturated hydrocarbon group in the presence of (a) water, (b) an alcohol, and (c) a palladium catalyst.

4,638,095

ISOLATION OF A NOVEL ANTIOXIDANT ROSMARIDIPHENOL FROM *ROSMARINUS OFFICINALIS* L.

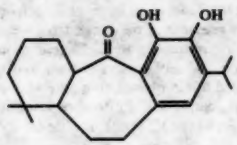
Stephen S. Chang; Chi-Tang Ho, both of East Brunswick, and Christopher M. Houlihan, Parsippany, all of N.J., assignors to Research Corporation, New York, N.Y.

Filed Aug. 10, 1984, Ser. No. 639,899

Int. Cl.[4] C07C 49/573

U.S. Cl. 568—326 1 Claim

1. A compound of the formula:



4,638,096

PROCESS OF PREPARING HYDROXYARYLALDEHYDES AND CATALYST THEREFOR

Michael J. Virnig, Fridley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Oct. 12, 1982, Ser. No. 433,745
Int. Cl.[4] C07C *47/565, 45/45*
U.S. Cl. 568—433 32 Claims

1. In a process of preparing an hydroxyarylaldehyde wherein a phenolic compound is reacted with formaldehyde in the presence of a solvent and a catalyst, the improvement wherein said catalyst is an organic moiety containing titanium (IV) or zirconium (IV) compound.

4,638,097

REDUCING THE CONTENT OF CYCLIC OLIGOMERIC ETHERS IN POLYTETRAMETHYLENE ETHER GLYCOLS OR POLYOXYBUTYLENE POLYOXYALKYLENE GLYCOLS

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,467
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1985, 3514547
Int. Cl.[4] C07C *41/38*
U.S. Cl. 568—617 7 Claims

1. A process for reducing the content of cyclic oligomeric ethers in a polytetramethylene ether glycol or polyoxybutylene polyoxyalkylene glycol, wherein a polytetramethylene ether glycol or a polyoxybutylene polyoxyalkylene glycol which contains the said ethers and has a mean molecular weight of from 200 to 450 is mixed with a mixture of water and a hydrocarbon, and, after phase separation, the purified polytetramethylene ether glycol or polyoxybutylene polyoxyalkylene glycol is isolated from the aqueous phase.

4,638,098

CATALYTIC ETHERIFICATION OF PHENOLS TO ALKYL ARYL ETHERS

Allen B. Mossman, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 10, 1986, Ser. No. 838,108
Int. Cl.[4] C07C *41/09*
U.S. Cl. 568—630 12 Claims

1. A process for etherifying phenols comprising reacting phenols at elevated temperature and pressure with a reactant selected from the group consisting of alcohol, ether and mixtures thereof in the presence of a catalyst comprising a sulfated oxide of a Group IIB metal selected from the group consisting of Zn, Cd, Hg and mixtures thereof on a support.

4,638,099

METHOD FOR MAKING 4,4'-DIHYDROXYDIPHENYL ETHER

Achim Riemann, Griesheim, and Werner Ude, Darmstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 23, 1986, Ser. No. 821,899
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506845
Int. Cl.[4] C07C *41/26, 43/295*
U.S. Cl. 568—638 10 Claims

1. A method for making 4,4'-dihydroxy-diphenyl ether from diphenyl ether, which method comprises

oxidatively iodinating diphenyl ether;

hydrolyzing the iodinated diphenyl ether with a base to form diphenyl-ether-4,4'-diphenolate and iodide;

liberating 4,4'-dihydroxydiphenyl ether in the basic hydrolyzate by the addition of acid thereto;

oxidizing iodide in the acidic filtrate to iodine; and

recycling said iodine to the iodination of diphenyl ether.

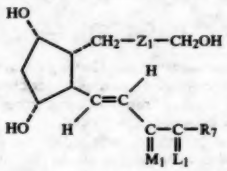
4,638,100

AROMATIC OR INTER-OXA 2-DECARBOXY-2-HYDROXYMETHYL-PGFα COMPOUNDS

Norman A. Nelson, Charleston Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 329,081, Dec. 9, 1981, abandoned, which is a continuation of Ser. No. 914,330, Jun. 5, 1978, abandoned, which is a continuation of Ser. No. 822,022, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 822,021, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 822,032, Aug. 5, 1977, abandoned, which is a continuation of Ser. No. 822,304, Aug. 5, 1977, abandoned, which is a division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602, and a continuation of Ser. No. 778,646, Mar. 17, 1977, abandoned, and a continuation of Ser. No. 778,648, Mar. 17, 1977, abandoned, which is a division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Sep. 30, 1985, Ser. No. 783,048
Int. Cl.[4] C07C *43/205*
U.S. Cl. 568—645 1 Claim

1. A prostaglandin analog of the formula



wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3 or a mixture of α-R_3:β-R_4 and a-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, with the provisos that

(1) one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; and

(2) one of R_3 and R_4 is fluoro only when R_7 is other than phenoxy,

wherein M_1 is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl,

wherein Z_1 is

—(m—Ph)—Z_3—$(CH_2)_g$—,

wherein —(m—Ph)— is inter-m-phenylene, Z_3 is oxa, and g is one, 2 or 3, and

R_7 is phenoxy optionally substituted by one, 2, or 3 chloro, fluoro, trifluoromethyl, (C_1–C_3) alkyl, or (C_1–C_3) alkoxy, the various substituents being the same or different with the proviso that not more than two such substituents are other than alkyl.

4,638,101

COMPOSITIONS

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

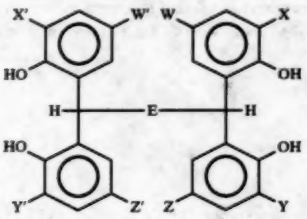
Division of Ser. No. 688,244, Jan. 2, 1985, Pat. No. 4,604,434. This application Mar. 24, 1986, Ser. No. 843,201

Int. Cl.[4] C07C *39/12*

U.S. Cl. 568—720 7 Claims

1. A composition comprising a compound of the formula

FIG. II



wherein X, X', Y, Y', W, W', Z, Z' and E are the same or different and are hydrogen or alkyl of one to about six carbon atoms, inclusive; W, W', Z and Z' are the same or different and are alkyl of one to about six carbon atoms, inclusive; and E is alkylene or alkylidene of two to about twelve carbon atoms, inclusive.

4,638,102

RECRYSTALLIZATION OF BISPHENOL A BY AZEOTROPICALLY DRYING THE SOLVENT

Douglas J. Little, Wichita, Kans., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 30, 1985, Ser. No. 814,814

Int. Cl.[4] C07C *37/84, 37/68*

U.S. Cl. 568—724 18 Claims

1. The method of separating o,p'isomers of bisphenol A from the p,p'-isomers of bisphenol A comprising the steps of:

(a) mixing said isomeric mixture of bisphenol A with water (H_2O) and an organic solvent (not miscible in water) for said bisphenol at between about 85° and about 105° C. in the presence of water;

(b) slowly heating the resulting mixture with agitation to between about 68° C. and the melting point of bisphenol A under a pressure sufficient to vaporize only an azeotropic ratio of water and the organic solvent at the temperature employed;

(c) removing the azeotropic vapors which form from the heated mixture, to reduce the total volume of water in the liquid state of the mixture until crystallization initiates in the liquid at the temperature of the mixture;

(d) cooling the remaining mixture to effectuate first mass of crystalline solids formation in the mixture;

(e) separating the crystalline solids from the mother liquor prior to cooling the mixture to below about 64° C., and recovering a solid product having less o,p'-isomer than in the bisphenol A fed to step (a), and

further, optionally subjecting the so recovered solid to at least one of the steps selected from the group consisting of

(f) washing the crystalline solids with a solvent; and/or

(g) drying the crystalline solids.

4,638,103

PREPARATION OF DELTA-TERPINEOL

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Oct. 1, 1985, Ser. No. 782,646

Int. Cl.[4] C07C *35/18*

U.S. Cl. 568—827 6 Claims

1. A method of preparing delta-terpineol, comprising an E2 elimination reaction of 1,8-cineole, wherein the elimination reagent is an alkali metal aryl compound wherein aryl is selected from the group consisting of phenyl, tolyl, xylyl, p-phenoxyphenyl, biphenyl, p-terphenyl, naphthyl, anthryl, phenanthryl and pyrenyl.

4,638,104

PREPARATION OF TERPINEN-4-OLS AND INTERMEDIATES

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Oct. 1, 1985, Ser. No. 782,647

Int. Cl.[4] C07C *35/18*

U.S. Cl. 568—827 8 Claims

1. A method for the preparation of l-terpinen-4-ol and 1(7)-terpinen-4-ol, comprising an E2 elimination of 1,4-cineole, wherein the elimination reagent is an alkali metal aryl compound wherein aryl is selected from the group consisting of phenyl, tolyl, xylyl, p-phenoxyphenyl, biphenyl, p-terphenyl, naphthyl, anthryl, phenanthryl and pyrenyl.

4,638,105

ACID-CATALYZED XYLENE ISOMERIZATION

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 713,213, Mar. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 631,688, Jul. 16, 1984, Pat. No. 4,524,140, which is a continuation-in-part of Ser. No. 465,987, Feb. 14, 1983, Pat. No. 4,513,091. This application Oct. 15, 1985, Ser. No. 787,572

Int. Cl.[4] C07C *5/27*

U.S. Cl. 585—481 15 Claims

1. A process for converting feedstock comprising xylene isomers to isomerization conversion product comprising xylene isomers which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition prepared by a method for substituting aluminum or gallium for boron or iron contained in the robust framework of a high silica content crystalline zeolite, which method comprises hydrothermally treating said zeolite in the presence of a compound of said aluminum or gallium, said hydrothermal treatment being under conditions effective to induce said substitution.

4,638,106

TWO STAGE PROCESS FOR IMPROVING THE CATALYST LIFE OF ZEOLITES IN THE SYNTHESIS OF LOWER OLEFINS FROM ALCOHOLS AND THEIR ETHER DERIVATIVES

Wim J. M. Pieters, Morristown, N.J., and Yoshiharu Okumura, Tokyo, Japan, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 630,636, Jul. 13, 1984, Pat. No. 4,554,260. This application Aug. 26, 1985, Ser. No. 769,357

Int. Cl.[4] C07C *1/00*

U.S. Cl. 585—640 11 Claims

1. A process for converting an alcohol and/or ether feed as hereinafter defined to a hydrocarbon mixture rich in olefins which comprises contacting, under conversion conditions at a conversion reaction temperature of from about 300° to 350° C., a feed comprising one or more monohydric alcohols having from about 1 to about 4 carbon atoms, ethers derived therefrom, or mixtures of said alcohols and ethers, with a modified crystalline metalosilicate shape selective acidic zeolite, wherein said metalosilicate is selected from the group consisting of aluminum, gallium, and mixtures thereof, and wherein said zeolite, prior to modification and in the absence of any coke deposited thereon, possesses:

(a) the capability of catalyzing said alcohol and/or ether conversion reaction;

(b) a channel size and structure such as to permit (i) entry of the said feed into the zeolite and diffusion to the active acid sites within said zeolite, and (ii) formation of olefin products within said zeolite and diffusion of said products out of the zeolite; and

(c) hydrothermal stability at temperatures of at least about 290° C.; and wherein the modification of said zeolite is conducted in a manner sufficient to increase the catalyst life of said zeolite, relative to the absence of said modification when said zeolite is employed as a catalyst for said alcohol and/or ether conversion reaction, by a process comprising:

(A) contacting said zeolite with coke precursor forming feed for a period of from about 0.5 to about 4 hours, said coke precursor forming feed being (i) comprised of at least one member selected from the group consisting of monohydric alcohols having from 1 to about 4 carbon atoms, ethers derived from said alcohols, olefins having from about 1 to about 5 carbon atoms, and mixtures thereof; and (ii) heated to a temperature of from about 320° to about 350° C.; and

(B) contacting the zeolite, treated in accordance with Step (A), with an inert gas heated to a temperature of from about 350° to about 425° C. for a period of at least 1 hour.

4,638,107

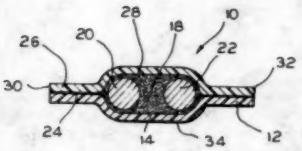
HEAT SENSITIVE TAPE AND METHOD OF MAKING SAME

Bayard C. Davis, Lombard, Ill., assignor to XCO International, Inc., Elgin, Ill.

Continuation of Ser. No. 542,007, Oct. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 352,978, Feb. 26, 1982, abandoned. This application May 23, 1985, Ser. No. 738,521

Int. Cl.[4] H01L *35/08*

U.S. Cl. 136—237 31 Claims



1. A heat sensitive tape operable in a predictable fashion over a range of temperatures for generating a measurable voltage indicative of the temperature along said tape to provide a continuous temperature sensor, comprising:

an elongated flexible strip of electrically non-conductive material;

a pair of thermoelectric conductors extending along said strip in spaced apart side-by-side relation,

said conductors being formed of thermoelectrically dissimilar materials; and

means for passively self-generating a continuous temperature representative measurable voltage between said conductors when said tape is exposed to ambient temperature without the use of an external power source, said continuous temperature representative measurable voltage being adapted for conversion into ambient temperature measured in degrees, said passive self-generating means comprising a material having a negative temperature coefficient in contact with both of said conductors substantially along their entire length;

said passive self-generating means causing an increase or decrease in said continuous temperature representative measurable voltage responsive to an associated increase or decrease in ambient temperature at every location along said tape, the change in said voltage under such condition being measurable and representative of an increase or decrease in ambient temperature and adapted for conversion into a new ambient temperature along said cable measured in degrees, said passive self-generating means also causing a change in said continuous temperature representative measurable voltage responsive to an associated increase in temperature above the prevailing ambient at any location along said tape, the change in said voltage under such condition also being measurable and representative of an increase in localized temperature and adapted for conversion into a maximum temperature along said tape measured in degrees;

whereby said heat sensitive tape may be utilized not only to monitor ambient temperature but also to monitor for any localized increase in temperature over said range of temperatures for said tape in a predictable fashion to provide a continuous temperature sensor.

4,638,108

PHOTOELECTRIC CONVERSION DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

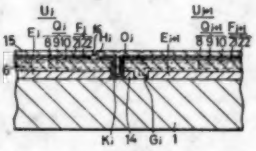
Division of Ser. No. 620,171, Jun. 13, 1984, which is a division of Ser. No. 554,807, Nov. 23, 1983, Pat. No. 4,527,006. This application Jul. 31, 1985, Ser. No. 760,873

Claims priority, application Japan, Nov. 24, 1982, 57-206809; Nov. 24, 1982, 57-206806; Feb. 22, 1983, 58-28211; Apr. 29, 1983, 58-75713; Oct. 31, 1983, 58-204443

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] H01L *27/14*

U.S. Cl. 136—244 9 Claims



1. A photoelectric conversion device comprising:

a substrate having an insulating surface; and

a plurality n (n being an integer larger than one) of semiconductor elements U_1 to U_n sequentially formed thereon side by side and connected in series one after another;

wherein the semiconductor element U_i (i=1, 2, 3 . . . n) has a first electrode E_i formed on the substrate, a non-single-crystal semiconductor laminate member Q_i formed on the first electrode E_i and having formed therein at least one semiconductor junction, and a second electrode F_i formed on the non-single-crystal semiconductor laminate member Q_i in opposing relation to the first electrode E_i;

wherein the first electrodes E_j and E_{j+1} (j=1, 2, . . . (n−1)) are separated by a first groove G_j;

wherein the second electrode F_{j+1} of the semiconductor element U_{j+1} is coupled with the first electrode E_j of the semiconductor element U_j through a coupling portion K_j formed by an extension of the second electrode F_{j+1} and extending into a second groove O_j formed in the non-single-crystal semiconductor laminate member Q_j and spaced from the first groove G_j; and

wherein the second electrodes F_j and F_{j+1} are separated by an isolating portion H_j, the isolating portion H_j being a third groove in said second electrode opposite the first electrode E_j but spaced from the second groove O_j and extending to and terminating at the semiconductor laminate member Q_j.

4,638,109

SUN LIGHT ELECTRICITY GENERATOR

Takashi Ishihara, Ashiya; Kazuhiro Okaniwa, Itami, and Genshiro Nakamura, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,276

Claims priority, application Japan, May 15, 1984, 59-97848

Int. Cl.[4] H01L *31/06, 27/14*

U.S. Cl. 136—244 5 Claims

1. A sun light electricity generator including an amorphous sun light battery, comprising:

a conductive substrate, said conductive substrate being an output electrode;

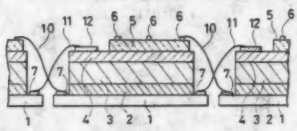
amorphous semiconductor layers provided on said substrate, said layers including at least a single p-i-n junction structure for the formation of a sun light battery element and a protection diode;

a collection electrode affixed on said sun light battery element and a metal electrode provided for said protection

diode, said metal electrode and said collection electrode being affixed to the same light incident surface of said amorphous semiconductor layers but separated from each other by a predetermined distance; and

a connection electrode provided on a region of said conductive substrate where said amorphous layers are not provided;

said collection electrode, said metal electrode, and said connection electrode being simultaneously affixed to said sun light battery element, said protection diode, and said



conductive substrate, respectively, thereby reducing construction time and enhancing reliability.

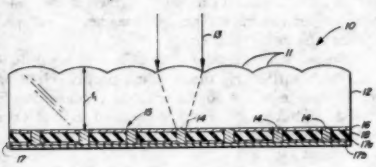
A sun light generator as set forth in claim **1**, wherein a plurality of amorphous sun light batteries are provided, said collection electrode for said sun light battery element being connected to said connection electrode of an adjacent amorphous sun light battery element and said metal electrode provided for said protection diode being connected to said connection electrode of another adjacent amorphous sun light battery.

4,638,110

METHODS AND APPARATUS RELATING TO PHOTOVOLTAIC SEMICONDUCTOR DEVICES

Virgil Erbert, Tijeras, N. Mex., assignor to Illuminated Data, Inc., Albuquerque, N. Mex.

Filed Jun. 13, 1985, Ser. No. 744,424
Int. Cl.[4] H01L *27/14, 31/18*
U.S. Cl. 136—246 **45 Claims**



28. A laminated sheet product useful in photovoltaic devices comprising:

a light-transmissive lens sheet having a first side in which a matrix of a multiplicity of concentrating lenses is formed and having an opposing substantially flat second side;

a substrate adhered to the second side of said lens sheet including a layer of electrically conductive material forming a first conductor;

a matrix of voids forming cell sites in said substrate extending at least through the first conductor and optically below the concentrating lenses whereby radiation concentrated by a lens is directed to a cell site for a selected angle of incidence of the radiation.

44. The invention of any one of claims **28**, **29** or **30** further comprising:

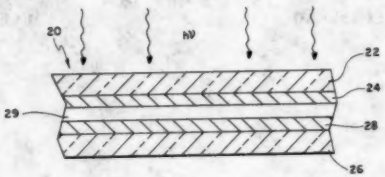
a photovoltaic semiconductor crystal disposed at each cell site, in electrical contact with the first conductor and optically visible through the lens sheet.

4,638,111

THIN FILM SOLAR CELL MODULE

Robert R. Gay, Granada Hills, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 4, 1985, Ser. No. 741,084
Int. Cl.[4] H01L *25/08, 31/06*
U.S. Cl. 136—249 **14 Claims**



1. A thin film solar cell module comprising a first solar cell panel containing an array of solar cells consisting of a TFS semiconductor sandwiched between a transparent conductive zinc oxide layer and a transparent conductive layer selected from the group consisting of tin oxide, indium tin oxide, and zinc oxide deposited upon a transparent superstrate,

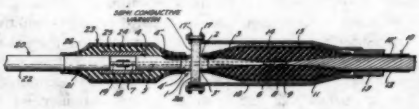
and a second solar cell panel containing an array of solar cells consisting of a CIS semiconductor layer sandwiched between a zinc oxide semiconductor layer and a conductive metal layer deposited upon an insulating substrate, said zinc oxide semiconductor layer containing a first relatively thin layer of high resistivity zinc oxide adjacent said CIS semiconductor and a second relatively thick layer of low resistivity zinc oxide overlying said high resistivity zinc oxide layer, said transparent conductive zinc oxide layer of said first panel facing said low resistivity zinc oxide layer of said second panel, said first and second panels being positioned optically in series and separated by a transparent insulating layer.

4,638,112

STOP JOINT FOR INTERCONNECTING TWO ELECTRICAL CABLES OF DIFFERENT TYPES

Giancarlo Giorgio, and Bruno Parmigiani, both of Milan, Italy, assignors to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Dec. 16, 1985, Ser. No. 809,147
Claims priority, application Italy, Dec. 17, 1984, 24092 A/84
Int. Cl.[4] H02G *15/25*
U.S. Cl. 174—22 R **6 Claims**



1. Stop joint between two electrical cables of different types, one of said cables being insulated with layers of solid insulation which are impregnated with a dielectric fluid and having a sheath and the other of said cables having extruded solid insulation without a dielectric fluid and each of said cables having a conductor, said stop joint comprising:

a body of insulating material enclosing a metal rod except at end portions thereof, one end portion of said rod extending from one end of said body and the other end portion of said rod extending from the other end of said body, said body having an outer surface of a decreasing taper in the direction from a portion of the body intermediate its ends toward said one end of said body and of cylindrical form in the direction from said portion of said body intermediate its ends to said other end of said body;

first connecting means mechanically and electrically connecting said one end portion of said rod to the end of the conductor of said one of said cables;

layers of solid insulation around said first connecting means, around a portion of the insulating material of said body adjacent said one end portion of said rod and around an end portion of said insulation of said one cable;

a conductive enclosure around the last-mentioned said layers of solid insulation and said first connecting means and connected in fluid-tight relation at one end with said sheath and at the opposite end with said body to provide a fluid-tight enclosure around the last-mentioned said layers of solid insulation and said first connecting means;

dielectric fluid of said one cable in said enclosure;

second connecting means mechanically and electrically connecting said other end portion of said rod to the end of the conductor of said other of said cables; and

a composite sleeve including solid insulation around said second connecting means, a portion of the insulating material of said body adjacent to said other end portion of said rod and a portion of the extruded solid insulation of said other of said cables adjacent to said second connecting means, said composite sleeve being without a metal enclosure therearound.

4,638,113

TRANSPOSED BAR FOR AN ELECTRICAL MACHINE

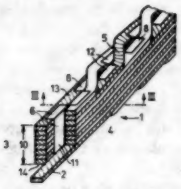
Jürgen Höwing, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Jul. 5, 1985, Ser. No. 752,408

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425982

Int. Cl.⁴ H02K *3/14*

U.S. Cl. 174—34 **3 Claims**



1. A transposed bar for an electrical machine consisting of individually insulated conductor elements which are arranged in adjoining conductor element stacks, each conductor element passing through all levels and being transposed at the narrow sides of the bars by offsets alternating from one to the other conductor element stack, in which a strip of insulating material designated as a strut is arranged vertically between the conductor element stacks extending beyond the conductor element stacks in height and wherein a plurality of sections of insulating material are positioned horizontally beneath a plurality of offset points of the conductor elements, the improvement comprising, having uniform incisions on the strip running along both longitudinal edges forming the plurality of sections with that portion between each opposite incision having a vertical height which matches the height of the conductor element stacks, the sections being bent into a horizontal position located underneath the offset points of the transposed conductor element.

4,638,114

SHIELDED ELECTRIC WIRES

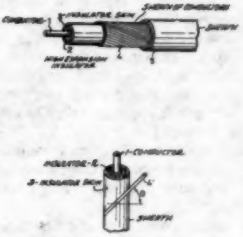
Akinori Mori, Tochigi, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 17, 1985, Ser. No. 744,995

Claims priority, application Japan, Jun. 19, 1984, 59-92291[U]

Int. Cl.⁴ H01B *7/34*

U.S. Cl. 174—36 **7 Claims**



1. A shielded electric wire comprising:

an electric conductor having a longitudinal axis;

a high expansion insulating layer having a degree of expansion of at least 65% provided around said conductor; and

closed shield layer means, surrounding said insulating layer, for shielding said insulating layer and said conductor without compressing said insulating layer and without hindering an expansion thereof, said shield layer means including a plurality of electrically conducting wires wound around said insulating layer at a winding angle of 80°–85° to a perpendicular to said longitudinal axis of said conductor.

4,638,115

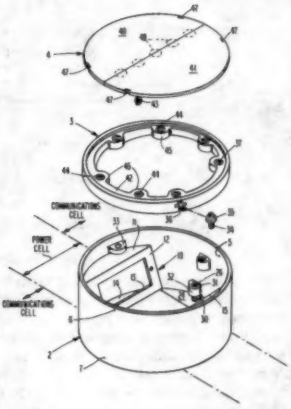
THREE SERVICE AFTERSET

Richard D. Benscoter, Vienna, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.

Continuation of Ser. No. 685,030, Dec. 21, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 853,702

Int. Cl.⁴ H02G *3/08*

U.S. Cl. 174—48 **5 Claims**



1. A three service afterset to be disposed over cellular raceway means having a power cell and communications cells located on opposite sides thereof with each cell having an access opening in the crest thereof, the afterset comprising:

an annular shaped, hollow housing having an inner wall, a top end, and a bottom end;

a first top connected to said inner wall adjacent said top end and extending outwardly from the inner wall, a first receptacle mounting plate connected to the first top and extending toward said bottom end and the first receptacle plate having an opening to receive a receptacle;

said first top, said inner wall and said first receptacle mounting plate forming a first hollow power compartment to be disposed over the access opening in said power cell;

a second top connected to the inner wall adjacent said top end at a position diametrically opposite to the first top and extending outwardly from the inner wall, and a second receptacle mounting plate connected to the second top and extending toward said bottom end and the second receptacle mounting plate having an opening to receive a receptacle;

said second top, said inner wall, and said second receptacle mounting plate forming a second hollow power compartment to be disposed over the access opening in said power cell;

a bottom cover having a first pair of opposite edges and a second pair of opposite edges, the bottom cover being disposed between the lower ends of said first and second receptacle plates and the first pair of opposite edges of the bottom cover being connected respectively to the lower ends of said first and second mounting receptacle plates and the second pair of opposite edges each being spaced from said inner wall; and

said inner wall and each edge of said second pair of opposite edges forming first and second communications openings to be respectively disposed over the access openings in said communications cells.

4,638,116

MASKING OF HOLES IN CIRCUIT PATTERNS ON CIRCUIT BOARDS PRIOR TO FLOW SOLDERING

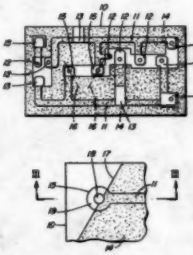
Beverley W. Gumb, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 618,901, Jun. 8, 1984. This application Sep. 4, 1985, Ser. No. 772,573

Claims priority, application Canada, Jun. 4, 1984, 455752

Int. Cl.[4] H05K *1/00, 3/00*

U.S. Cl. 174—68.5 **4 Claims**



1. A circuit board having a circuit pattern on a surface thereof, said circuit pattern including at least one contact area, a hole extending through said contact area and said circuit board, said hole having a constant diameter through the contact area and the circuit board, the hole having an unplated periphery in the circuit board, and a layer of solder resist extending over said circuit pattern, said layer extending over part of said contact area and for part of the periphery of the hole.

3. A method for preventing the closing of an unoccupied hole in a circuit board, said circuit board including a circuit pattern on a surface thereof, said circuit pattern including a plurality of contact areas and said hole extending through one of said contact areas and said circuit board, said hole having a constant diameter through the contact area and circuit board and having an unplated periphery in the circuit board, comprising applying a layer of solder resist over said circuit pattern, the solder resist extending over part of said one of said contact areas and extending for part of the periphery of the hole.

4,638,117

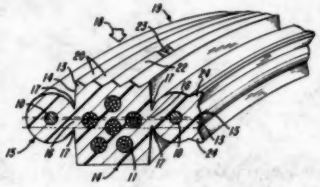
ELECTRICAL CABLE FOR COMMUNICATION PURPOSES

Robert Ney, Langerwehe Kreis Düren, Fed. Rep. of Germany, assignor to Lyneuwerk GmbH & Co. Kommanditgesellschaft, Aachen, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,316

Int. Cl.[4] H01B *7/08*

U.S. Cl. 174—117 F **19 Claims**



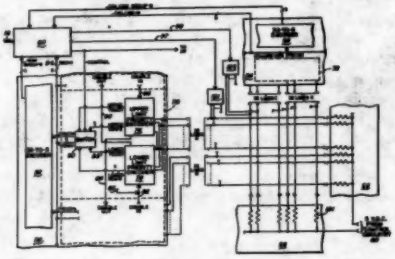
1. An electrical cable, for communication purposes, having at least two spaced-apart, insulated electrical conductor means, between which is disposed a portion having a block-shaped cross-section, with a plurality of tension-absorbing elements of high-strength fibers being disposed in said block-shaped portion; the insulation of said conductor means, and said block-shaped portion, being formed by a connecting casing of thermoplastic or elastomeric material in which said conductor means and said tension-absorbing elements are embedded in such a way that they are essentially oriented in the longitudinal direction of said cable parallel to one another; and provided between a given block-shaped portion and an adjoining casing of a conductor means, are longitudinally extending separating grooves, so that said cable has an at least three-part cross-sectional configuration;

the improvement comprising a number of said tension-absorbing elements, which are distributed in said block-shaped portion; said conductor means are placed on the bending axis of said cable, which is determined by said tension-absorbing elements, by the effect of said conductor means on the bending properties, and by said casing material; an imaginary line, which connects said conductor means, is displaced to such an extent that it coincides with the bending axis which is optimum for said cable, so that the transverse central planes of said conductor means are disposed in said bending axis; bridges of said casing material are respectively formed between a given block-shaped portion and an adjoining casing of a conductor means at the location of said separating grooves, with the depth of the latter being such that said bridges of material are uniformly aligned with said optimum bending axis, i.e. are centrally disposed over said imaginary line which connects said conductor means; said tension-absorbing elements being disposed in said block-shaped portions in an unsymmetrical manner.

4,638,118
WRITING PAD

An Wang, Lincoln; Shu-Kuang Ho, Carlisle, both of Mass., and Carlos I. Mainemer, Nashua, N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 11, 1985, Ser. No. 710,198
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—18 24 Claims



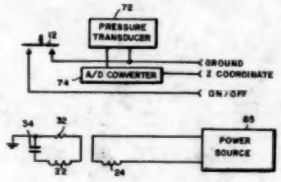
1. Scanning circuitry for a writing pad of the kind having a succession of parallel electrical sensing lines defining a series of positions along one dimension of a writing surface of said pad, said electrical sensing lines being responsive to writing stimuli received at said writing surface, said scanning circuitry comprising

identifying circuitry for identifying the upper and lower boundaries along said dimension of an adaptive local region at which said writing stimuli is being received, said local region encompassing more than one said position at which stimuli are being received, and said local region changes its location according to the position at which stimuli are being received to maintain the positioning of said local region relative to the current stimuli position.

4,638,119
POSITION INDICATING APPARATUS FOR USE IN A DIGITIZING TABLET SYSTEM

Barry A. Blesser, Raymond, N.H., and Thomas C. Prentice, West Newton, Mass., assignors to Pencept, Inc., Waltham, Mass.

Filed Nov. 16, 1984, Ser. No. 672,310
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—19 34 Claims



1. A position indicating implement comprising:

a first coil;

an alternating current power source connected to said first coil to produce a current in said first coil;

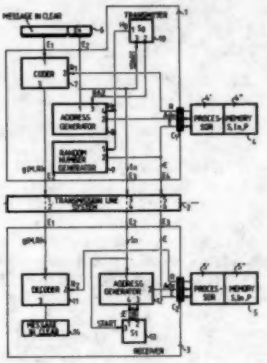
a second coil positioned so as to be inductively coupled with said first coil; and

a capacitor connected in series with said second coil so that the current in said first coil induces a phase shifted current in said second coil.

4,638,120
METHOD AND SYSTEM FOR TRANSMISSION OF CONFIDENTIAL DATA

Robert J. L. A. Herve, Versailles, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Continuation of Ser. No. 657,470, Oct. 4, 1984, abandoned, which is a continuation of Ser. No. 235,505, Feb. 18, 1981, abandoned. This application Jan. 21, 1986, Ser. No. 820,594
Claims priority, application France, Mar. 3, 1980, 80 04701
Int. Cl.[4] H04L 9/02
U.S. Cl. 178—22.08 14 Claims



1. A method for transmission of confidential data between a transmitter and a receiver connected by a transmission line system, the transmitter including a coding device and the receiver including a decoding device, said method comprising:

generating a first key and transmitting the first key to the receiver;

calculating in a first portable electronic object coupled to the transmitter a second key from a first code stored in the first portable electronic object, from a second code related to the data to be transmitted and which identifies data authorized to be transmitted by a bearer of the first portable electronic object, and from the first key;

transmitting the second code to the receiver;

coding at the transmitter the data to be transmitted with the second key;

calculating at the receiver, in a second portable electronic object coupled to the receiver, a third key using the first key and the second code and a third code stored in the second portable electronic object; and

decoding the data received with the third key calculated at the receiver.

4,638,121
TELEPHONE PAY STATION

Robert A. Clark, Jr., Ft. Lauderdale, Fla., assignor to Communications Equipment and Engineering Co., Plantation, Fla.

Filed Jul. 10, 1985, Ser. No. 753,534
Int. Cl.[4] H04M 17/02
U.S. Cl. 379—145 12 Claims

1. A coin receiving telephone station for local calls only includes a telephone receiver and transmitter with a handset and a supporting hook switch cradle therefor comprising:

a coin chute having an open end for receiving a coin and a lower end for discharging coins into a coin box;

solenoid controlled arm means movable into said coin chute adjacent said open end for retaining a coin deposited in said chute in a partially exposed retrievable position permitting manual retraction from said chute; and

circuit means for activating said solenoid controlled arm

means to move out of said coin chute for permitting a coin previously retained therein to drop into said coin box

when a called party answers a call over three digits dialed at said station.

4,638,122

MONOLITHICALLY INTEGRATABLE TELEPHONE CIRCUIT FOR GENERATING CONTROL SIGNALS FOR DISPLAYING TELEPHONE CHARGES

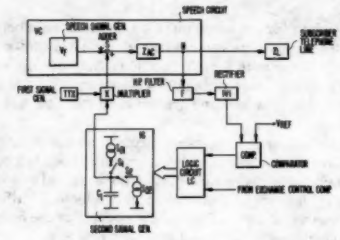
Marco Siligoni, Milan; Ferdinando Lari, Mantova; Vanni Saviotti, Milan, and Vittorio Comino, Turin, all of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed May 6, 1985, Ser. No. 731,167

Claims priority, application Italy, May 4, 1984, 20783 A/84; Jun. 6, 1984, 21270 A/84

Int. Cl.[4] H04M *15/18*

U.S. Cl. 379—124 **2 Claims**



1. A telephone circuit for generating control signals for a subscriber's charging display and constituting an interface between a subscriber's telephone line and exchange control components together with a subscriber's line speech circuit, said subscriber's line speech circuit comprising a speech signal generator and a circuit means for adapting signals supplied by said speech signal generator to the subscriber's telephone line, said telephone circuit comprising: a first voltage signal generator for supplying an AC signal having a predetermined amplitude and frequency which are constant over time, and a second voltage signal generator for supplying pulse signals which are uniformly spaced over time and which have a trapezoidal pulse waveshape, said second voltage generator being coupled to said exchange control components which determine starting times of a leading edge and a trailing edge of each of said pulse signals;

a multiplier circuit which is connected to said first and second voltage generators and which has a gain which is varied in a linear manner in accordance with a voltage level of said pulse signals generated bY said second voltage generator, said multiplier calculating the product over time of said voltage signals supplied by said first and second voltage generators and supplying a voltage signal which is added to signals generated by said speech signal generator included in said subscriber's line speech circuit and a coupling means for receiving, at a point along a signal path of said subscriber's line speech circuit, an image signal of said signals adapted to said subscriber's telephone line:

a high-pass filter connected to said coupling means for filtering said image signal so as to eliminate components of said signal included in a telephone band of speech signals; a rectifier circuit connected to said high-pass filter for rectifying said filtered image signal; and

a comparator connected to said rectifier circuit and to a reference signal generator for comparing a rectified signal output by said rectifier circuit with a reference signal generated by said reference signal generator and for generating, if an amplitude of said rectified signal is greater than an amplitude of said reference signal, a signal for stopping an increase of the signal level of a leading edge of signals which are generated by said second voltage generator, said signal level being kept constant up to the beginning of a trailing edge of said signals for said second voltage signal generator by means of a memory means included in the said second signal voltage generator.

4,638,123

CIRCUIT ARRANGEMENT FOR A SMALL PABX WITH A SWITCHING MATRIX THAT HAS ELECTRONIC CROSSPOINTS

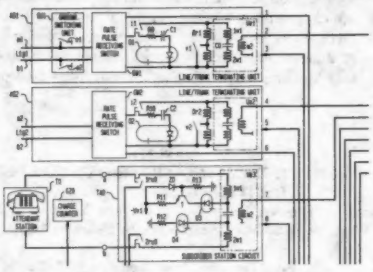
Alois Altendorfer; Ewald Dotzauer, both of Sauerlach, and Wolfgang Mueller, Geretsried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

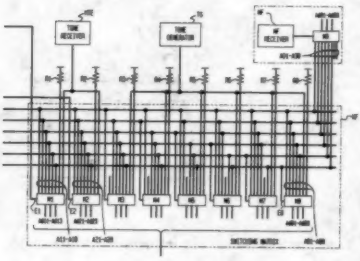
Filed Mar. 19, 1984, Ser. No. 590,658

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310546

Int. Cl.[4] H04M *7/14*; H04Q *3/52*

U.S. Cl. 379—229 **7 Claims**





1. In a circuit arrangement for a small private branch switching exchange for connecting subscriber station lines and exchange lines having a control computer unit that directs the line switching procedures of the private branch switching exchange and has access to memory devices in which informa-

tion necessary for the switching procedures is contained and directs internal and external connections by adjustment of a switching matrix with electronic crosspoints, the improvement comprising the switching matrix having a plurality of integrated selector components whose terminals at least equal the sum of the number of exchange lines and the number of subscriber stations, each of which selector components includes a plurality of terminals of a first kind, at least equal to the number of subscribers, and a single terminal of a second kind, which is assigned either to a subscriber station or to an exchange line, and on these selector components, based on control information fed to corresponding address inputs of a selector component by the control computer unit, a terminal is selected from the terminals of the first kind and connected with the terminal of the second kind, and each selector component, having its single terminal of a second kind assigned to a subscriber station, is coupled through the terminal of the second kind with the assigned one subscriber station and through the terminals of the first kind respectively with all other subscriber stations and each of the selector components, having its single terminal of a second kind assigned to an exchange line, is coupled through the terminal of the second kind with the assigned one exchange line and through the terminals of the first kind respectively with all the subscriber stations.

4,638,124

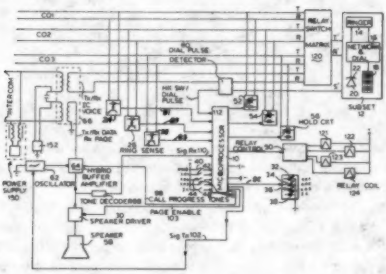
KEY TELEPHONE SYSTEM WITH DISTRIBUTED CONTROL

Franklin Hargrave, and Francisco A. Middleton, both of Newtown, Conn., assignors to ITT Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,742

Int. Cl.⁴ H04M *9/06*

U.S. Cl. 379—159 **36 Claims**



1. A communication system, comprising:

an intercom line;

a plurality of stations, each station connected to said intercom line and a plurality of telephone lines, said stations each including, means for transmitting and receiving information, switch means for selectively accessing said transmitting and receiving means to one of said telephone lines and intercom line, and control means for generating and receiving control signals and for controlling said switch means, said control means of each station being adapted to generate binary control signals, and each station further comprises means for converting said binary signals to PCM control signals; and

means for exchanging said control signals between stations, whereby the system is distributively controlled by said control means in each station and there is no need for centralized control.

4,638,125

HEARING AID WITH A HOUSING TO BE WORN BEHIND THE EAR

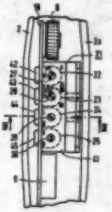
Gerhard Buettner, Grossenseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,797

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 8327115[U]

Int. Cl.⁴ H04R *25/00*

U.S. Cl. 381—68.4 **11 Claims**



1. A hearing aid having a housing to be worn behind a user's ear, said housing containing a microphone, an amplifier, a current source and an acoustic coil and a plurality of regulators for controlling selected operating characteristics of said hearing aid, said regulators and said acoustic coil being mounted in combination in a single unit in said housing and attached to said amplifier, said unit having a first portion having a plurality of receptacles for respectively receiving said regulators and a second portion in which said acoustic coil is embedded and a projection carried on at least one of said first and second portions and an eyelet carried on the other of said first and second portions for receiving said projection therethrough for rigidly connecting said first and second portions.

4,638,126

CRADLE SWITCH FOR A TELEPHONE APPARATUS

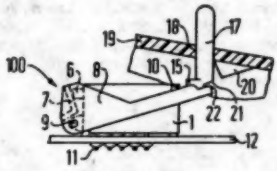
Karl-Jan Breu, Groebenzell, and Hans-Joachim Schinke, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,758

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342730

Int. Cl.⁴ H04M *1/08*

U.S. Cl. 379—427 **8 Claims**



8. In a cradle switch for a telephone apparatus having a housing with an opening in a wall and cradle at said opening, said cradle switch including a carrier having movable switch contacts, an actuating lever mounted at one end to the carrier for pivotal movement to actuate the contacts, and a switch member engaging the lever to mechanically actuate the lever and extending through the opening in the wall of the housing and into the cradle, the improvements comprising said actuating lever having a pair of parallel extending arms which extend along opposite sides of the carrier of the cradle switch, and

means for pivotally connecting said switch member for pivotal movement on a first axis at a free end of the lever, said means guiding the member for longitudinal movement with axial play relative to the first axis, said means including coacting pairs of pivot pins and bearing bores with the pins being provided on one of the lever and member and the bores being provided in the other of the lever and member, said pins and bores coacting to form a releasable connection.

4,638,127

ELECTRICAL CONTACTS FOR OSCILLATING YOKE OF LOAD SELECTOR

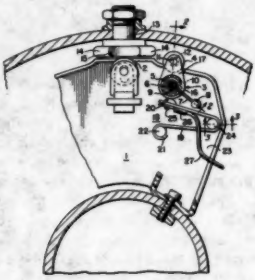
Jean-Claude Dufrasnes, Couillet, Belgium, assignor to Ateliers de Constructions Electriques de Charlerol (ACEC) Societe Anonyme, Brussels, Belgium

Filed Sep. 5, 1985, Ser. No. 772,686

Claims priority, application European Pat. Off., Sep. 5, 1984, 84201272

Int. Cl.⁴ H01H *1/16*

U.S. Cl. 200—11 K **5 Claims**



1. An electrical contact assembly comprising: a swiveling yoke mounted on a movable linkage, at least one roller cooperating with fixed contacts, said swiveling yoke having a return spring exerting a pivotal biasing force on said roller when said roller engages and rotates on each of said fixed contacts, said swiveling yoke having a cylindrical surface, an electrical conducting element connected to a voltage output and biased against said cylindrical surface by a mechanical force from a spring means.

4,638,128

DELAY SWITCH

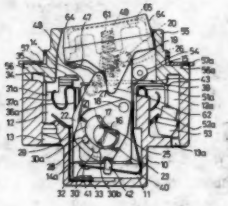
Hideo Kuwabara, and Takao Ohta, both of Tsu, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 16, 1985, Ser. No. 766,397

Claims priority, application Japan, Aug. 25, 1984, 59-177312

Int. Cl.⁴ H01H *7/00*

U.S. Cl. 200—33 R **8 Claims**



8. A delay switch comprising a body; a delay element disposed within said body and including a rotary output shaft; delay cam means arranged to be driven from a start position to a final position by said delay element, said delay cam means including a first pivotably mounted cam operably connected to said output shaft to be rotated thereby, and a second pivotably mounted cam operably connected to said first cam to be driven by a lost motion connection therebetween whereby said second cam remains stationary during a predetermined amount of rotation of said first cam and is thereafter rotated to said final position by said first cam; electrical contact means for connection to an external electrical component to be operated, said contact means arranged to be actuated by said second cam when said delay cam means is in said start position to operate said external component and deactuated when said delay cam means is in said final position; and a manual handle movable to a first position for setting said delay cam means in said start position and movable to a second position for actuating said delay element.

4,638,129

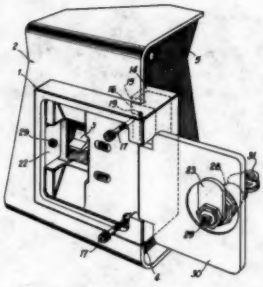
CONTROL SWITCH COVER

Fred P. Partus, Marietta, and Michael A. Jones, Atlanta, both of Ga., assignors to National Product Marketing, Atlanta, Ga.

Filed Dec. 14, 1984, Ser. No. 681,668

Int. Cl.⁴ H01H *9/20*

U.S. Cl. 200—43.22 **10 Claims**



1. A control switch cover assembly, for attachment to the cabinet of electronic or other equipment having a lipped edge adjacent to a control switch, which comprises:

a master plate of one piece solid construction which comprises a major portion having a flat face and an opening for access to the switch when said master plate is installed over the switch, and an el-shaped extension at the rear of said flat portion having flanges at the top and bottom thereof which form a notch between each of said flanges and the flat face of said major portion, for receiving the lipped edge of the cabinet when said plate is installed over the switch;

a door connected to said master plate with locking means, for covering the switch access opening of said master plate;

a tension plate, received within said flanges and said el-shaped extension of said master plate;

means for connecting and tightening said tension plate to said master plate, for applying force to the lip of the cabinet when the lip is located within the notches of said master plate to hold the control switch cover assembly in place on the cabinet; and

means for engaging said master plate with the control switch to prevent movement of the control switch cover assembly when the control switch cover assembly is installed over the switch.

4,638,130

ACCELERATION SENSOR

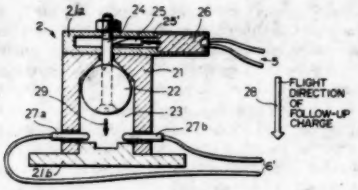
Peter Grösser, Hochstadt, and Norbert Nissl, Aresing, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,089

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338784

Int. Cl.⁴ H01H *35/14*

U.S. Cl. 200—61.45 R **5 Claims**



1. An acceleration sensor having a high sensitivity in a wide range of accelerations, comprising housing means (21) forming a cavity having a central axis defining a sensing direction, acceleration sensing mass means (22), mounting means (24) releasably mounting said sensing mass means in said cavity of said housing means, releasing means including a cutting member operatively arranged for severing said mounting means for releasing said sensing mass means for movement in said cavity of said housing means in said sensing direction upon release of said sensing mass means, force applying means arranged for applying a cutting force to said cutting member, and switch means operatively arranged in said housing means in a position for actuation of said switch means by said sensing mass means after said sensing mass means has moved through a predetermined distance in said sensing direction in said cavity.

4,638,131

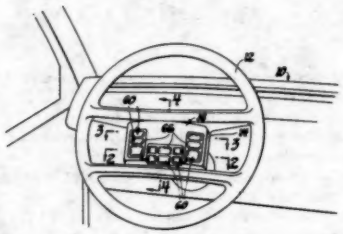
STEERING WHEEL PAD KEYBOARD SWITCH ASSEMBLY

Richard L. Kidd, Sterling Heights, Mich.; Jerry A. Graf, Cortland, Ohio; Philip J. Engler, Leavittsburg, Ohio, and Song-Chin S. Lu, Vienna, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 15, 1986, Ser. No. 818,955

Int. Cl.⁴ H01H *9/00, 13/70*

U.S. Cl. 200—61.55 **7 Claims**



2. A steering wheel pad keyboard switch assembly for mounting on a steering wheel comprising:

a base having means for attaching the assembly to a steering wheel hub,

a printed circuit board which is mounted on the base and which has a plurality of open contact grids disposed in a predetermined array within a U-shaped area which borders three sides of the printed circuit board,

a U-shaped elastomeric switch member which is mounted on the U-shaped area of the printed circuit board and which has a plurality of hollow buttons each having a conductive disc inside to provide a plurality of movable contacts which are disposed in the same said predetermined array for selectively closing the contact grids,

a guide plate which is disposed over the printed circuit board with the switch member sandwiched therebetween,

said guide plate having a U-shaped peripheral portion which has a plurality of guide holes disposed in the same said predetermined array for guiding operators into operative contact with the movable contacts of the switch member for selectively moving the contacts of the switch member into engagement with the contact grids,

said guide plate further having a pad portion nested within the U-shaped peripheral portion,

a horn switch disposed on the pad portion of the guide plate, and

a push button sub-assembly which overlies the guide plate and which is attached to the base to provide a unit handled assembly,

said push button sub-assembly comprising a frame member having a plurality of slide chambers disposed in the same said predetermined array, a plurality of push buttons slideably retained in the plurality of slide chambers respectively, and a soft decorative cover member,

said push buttons having stem pieces which extend into the guide holes of the guide plate and act as the aforesaid operators for selectively moving the contacts of the switch member into engagement with the contact grids, and

said cover having a depressible portion for operating the horn switch and cut-outs providing access to the push buttons.

4,638,132

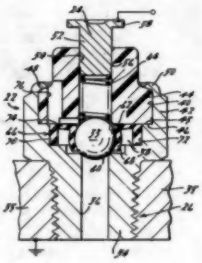
ELECTRICAL PRESSURE SWITCH

Ellsworth S. Miller, Mt. Clemens, Mich., assignor to Lectron Products, Inc., Rochester, Mich.

Filed Oct. 28, 1985, Ser. No. 791,712

Int. Cl.⁴ H01H *35/38*

U.S. Cl. 200—81 R **13 Claims**



1. An electrical pressure switch comprising

a housing provided with an internal chamber having an annular peripheral wall and an inlet communicating with said chamber and adapted to be connected to and to communicated with a source of relatively high and relatively low fluid pressures;

first and second electrical terminals electrically insulated from each other and disposed coaxially with respect to said peripheral wall;

a valve seat in said chamber disposed coaxially with respect to said wall and to said terminals;

a ball valve in said chamber movable within predetermined limits to and from said valve seat;

a compression spring confined between one of said terminals and said ball valve holding the latter at one limit of its travel with respect to said valve seat; and

a one-piece sealing element in said chamber having radially spaced inner and outer sealing lips extending axially in the direction of said inlet and of the other of said terminals, said ball valve being movable with respect to said valve seat to one limit of its travel against the resilient action of said spring means by fluid pressure in said chamber, and the sealing lips of said sealing element being urged in opposite directions by said fluid pressure into sealing engagement with said ball valve and said annular wall.

4,638,133

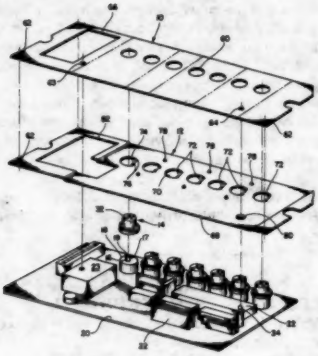
ROTARY SWITCH ASSEMBLY

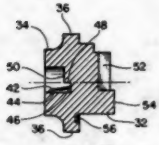
Robert F. Dvorak, Mount Vernon, and Charles E. Netolicky, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Apr. 5, 1985, Ser. No. 720,219

Int. Cl.[4] H01H *9/04, 3/08*

U.S. Cl. 200—302.1 **8 Claims**





1. A rotary switch assembly used for operating a rotary switch having a pin rotatable among a plurality of selectable positions, said assembly comprising:

a knob having a top portion, a bottom portion and a circumferential flange intermediate said top portion and said bottom portion;

said bottom portion including a generally circular recess extending toward said top portion and having a straight side wall and a base, said recess shaped and dimensioned to receive and encircle said pin,

said side wall including a crush rib extending into said recess toward said top portion adapted to be shaved in response to insertion of said pin into said recess; and

a compartment provided within said recess for receiving said shaved portions of said crush rib, said compartment partially defined by said side wall and recessed further than said base.

6. A rotary switch assembly used for operating a plurality of rotary switches, each switch having a pin rotatable among a plurality of selectable positions, said assembly comprising;

a knob provided for each switch which will be user operated, each knob having a generally circular top portion, a generally circular bottom portion and a circumferential flange intermediate said top portion and said bottom portion,

said bottom portion including receiving means for receiving said pin;

a thin bottom plate positioned over said knobs, said bottom plate having a slightly offset portion including a plurality of bottom apertures respectively receiving said top portion of a respective knob, said bottom plate including a lock tab extending into each said aperture towards the top portion of said knob, a thin, generally flat top plate including a plurality of apertures respectively aligned in registration with said bottom apertures and encircling said top portion of a respective knob in substantially close relationship with said knob; a plurality of dimples spacing said offset portion of said bottom plate from said top plate; and

a stop tab provided on said flange and operably associated with said lock tab to prevent the complete rotation of said knob within said bottom apertures.

4,638,134

DEVICE FOR EVACUATING, FILLING AND CLOSING FINAL STORAGE CONTAINERS FOR RADIOACTIVE MATERIALS

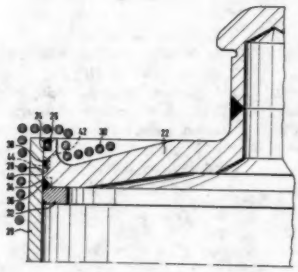
Detlef Stritzke, Mol, Belgium, assignor to Deutsche Gesellschaft, Fed. Rep. of Germany

Division of Ser. No. 343,827, Jan. 29, 1982. This application Oct. 18, 1984, Ser. No. 662,344

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104366

Int. Cl.[4] G21C *19/40;* **B23K** *13/00*

U.S. Cl. 219—9.5 **3 Claims**



1. A device for closing a metal storage container for radioactive material comprising

a cover for gas-tight closing of said container

an annular flange projecting from the inner wall of said container supporting said cover

the outer edge of said cover having at least one recess open only toward

the inside wall of said container

a shaped solder part disposed in said recess

an induction heater arranged around said cover and said container in the region where the cover joins the inside wall of said container for melting said solder part to seal the gap between the edge of the cover and the inside wall of said container

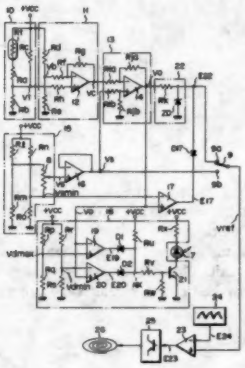
said induction heater comprising a copper coil and control means for heating the cover faster than the container.

4,638,135

INDUCTION HEAT COOKING APPARATUS

Masayuki Aoki, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 7, 1985, Ser. No. 689,338
Claims priority, application Japan, Jan. 20, 1984, 59-7961; Feb. 10, 1984, 59-23087
Int. Cl.[4] H05B 6/06
U.S. Cl. 219—10.49 R 19 Claims



1. An induction heat cooking apparatus, comprising:

a heating coil for providing an electromagnetic field, when excited to inductively heat a load;

exciter means for exciting said heating coil to cause variable amount of heating power to be output therefrom;

temperature setting means for providing a temperature set signal which designates a desired target temperature of said load;

temperature measuring means for measuring a temperature of said load to generate a temperature measure signal indicative thereof; and

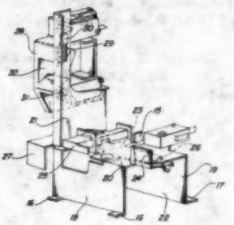
difference detector means, coupled to said temperature measuring means, said temperature setting means and said exciter means, for detecting a difference between said temperature set signal and said temperature measure signal and generating a difference signal indicative of said difference, and for supplying a difference signal to said exciter means to control the degree of excitation thereof, said heating power for said heating heating coil being continuously controlled to variable power levels in accordance with said difference signal so that said heating power is maintained at a first constant power level until said load temperature reaches a first value, and said heating power is then decreased at a definite rate until said load temperature reaches a second value greater than said first value, said rate being less than infinity to cause said heating power to gradually decrease as a function of time, so that when said load temperature approaches said set temperature, said heating power has been lowered from said first constant level, and therefore a rate of temperature increase of the load has been lowered to thereby maintain said load temperature close to said set temperature by varying said heating power to minimize an amount of temperature overshoot.

4,638,136

MICROWAVE OVEN WITH DOOR LATCHING ASSEMBLY

Yuichiro Oya, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1985, Ser. No. 707,204
Claims priority, application Japan, Mar. 1, 1984, 59-30298[U]
Int. Cl.[4] H05B 6/76
U.S. Cl. 219—10.55 C 4 Claims



1. A door latching assembly for a microwave oven, comprising:

a housing provided with a door, said door having a latch head means for securing the door and a lever means, operatively associated with the latch head means, for releasing the latch head means;

a door opening/closing unit having a horizontal plate provided between downwardly projecting vertical supporting plates, said horizontal plate further provided with an upwardly projecting vertical base plate extending from a side of said horizontal plate, said upwardly projecting vertical base plate being positioned behind a front panel aligned with the door;

a latch hook attached to the upwardly projecting vertical base plate so that the latch hook and the latch head means releasably engage behind a peripheral edge of the door wherein the latch head means is thereby secured to the vertical base plate;

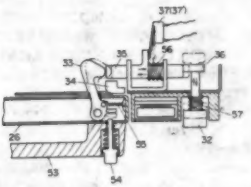
said door opening/closing unit including said latch hook, upwardly projecting vertical plate, horizontal plate and downwardly projecting vertical plates being secured only to the bottom plate of the oven.

4,638,137

HEATING APPLIANCE HAVING A FAIL-SAFE START SWITCH

Hirai Kazumi, Nabari, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00241, § 371 Date Apr. 29, 1982, § 102(e) Date Apr. 29, 1982, PCT Pub. No. WO82/01056, PCT Pub. Date Apr. 1, 1982
Continuation of Ser. No. 380,863, Apr. 29, 1982, abandoned.
This PCT application Sep. 21, 1981, Ser. No. 639,615
Claims priority, application Japan, Sep. 22, 1980, 55-132089
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 B 3 Claims



1. A heating appliance having a microcomputer which is governed by input signals introduced via a keyboard and hav-

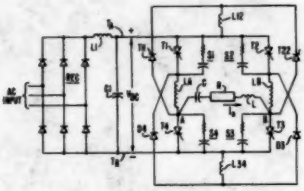
ing an oscillator which is controlled by output signals from said microcomputer and having a main power supply circuit which is enabled only in response to a manual operation of a heating start switch which is mechanically operable independently of said keyboard.

4,638,138

HIGH FREQUENCY INVERTER CIRCUIT FOR MELTING AND INDUCTION HEATING

John Rosa, Penn Hills, Pa., and William E. Frank, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1984, Ser. No. 633,775
Int. Cl.[4] H05B 6/04
U.S. Cl. 219—10.77 **7 Claims**



1. A two-pole inverter bridge mounted between opposite DC terminals supporting a voltage source including two poles mounted across said DC terminals, and a resonant load mounted across said poles;

each pole including first and second controlled switches and an inductor therebetween;

each pole having an inductor connected in series with said first and second switches, one end of said inductor being connected to the cathode electrode of one of said first and second switches, the other end of said inductor being connected to the anode electrode of the other of said first and second switches, the ends of respective inductors associated with identical electrodes forming two pairs across said poles;

said resonant load being connected between the ends of one of said two pairs;

each pole having a first circuit connected in antiparallel to one of said first and second switches and to said inductor, and a second circuit connected in antiparallel to the other of said first and second switches and to said inductor;

said first antiparallel circuit being effective to turn OFF a corresponding one of said switches upon one alternation of said resonant load, said second antiparallel circuit being effective to turn OFF a corresponding one of said switches upon the other alternation of said resonant load;

one of said first and second antiparallel circuits in each pole being connected to one of the ends of said resonant load and having an auxiliary switch and an auxiliary inductor in series thereto;

the other of said first and second antiparallel circuits in each pole having a diode and an auxiliary inductor in series thereto.

4,638,139

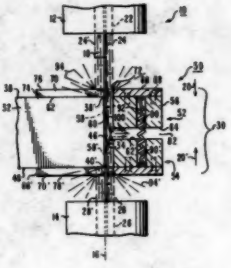
ELECTRICAL DISCHARGE MACHINE COOLING FLUID CONTAINMENT APPARATUS

Vincent A. Pirone, Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 21, 1984, Ser. No. 653,049
Int. Cl.[4] B23H 7/02, 1/10
U.S. Cl. 219—69 W **11 Claims**

1. Apparatus for controlling a cooling fluid stream applied parallel to an electrical discharge machine wire electrode dispensed adjacent an exterior surface of an electrically conductive workpiece to be processed thereby, said stream being directed toward said workpiece and tending to splash and be diverted from said wire electrode in a region adjacent said surface upon impingement on an edge of said workpiece at said surface, said apparatus comprising:

channel means adapted to abut an exterior surface of a workpiece for containing the fluid stream to reduce splashing



and diversion so that at least a portion of the stream surrounds the wire throughout a region adjacent the surface of the workpiece; and

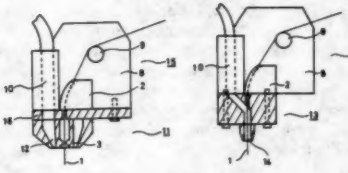
clamp means attached to said channel means to releasably secure said channel means to said workpiece surface, whereby said clamp means is carried by said workpiece.

4,638,140

APPARATUS FOR GUIDING A WIRE ELECTRODE OF A WIRE ELECTRODE DISCHARGE MACHINE

Haruki Obara, Sagamihara, and Toshiyuki Aso, Hino, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP84/00303, § 371 Date Jan. 28, 1985, § 102(e) Date Jan. 28, 1985, PCT Pub. No. WO85/00025, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 12, 1984, Ser. No. 700,886
Claims priority, application Japan, Jun. 14, 1983, 58-104926
Int. Cl.[4] B23H 1/00, 7/10
U.S. Cl. 219—69 W **1 Claim**



1. An apparatus for guiding a wire electrode of a wire electrode discharge machine, comprising:

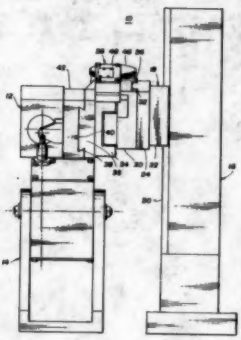
(a) a V-groove-type guide unit, including a V-groove-type wire guide and means for supplying a machining liquid; and

(b) a die-type wire guide unit removably attached at the lower surface of said V-groove-type guide unit, said die-type wire guide unit including a die-type wire guide and a machining liquid nozzle, and said machining liquid nozzle being connected to said machining liquid supply means and having a liquid channel surrounding said die-type wire guide.

4,638,141
MODULAR EDM SYSTEM

Leif Houman, Oyster Bay, and Leonard M. Wohlabaugh, Miller Place, both of N.Y., assignors to Xermac, Inc., Royal Oak, Mich.

Filed May 20, 1985, Ser. No. 736,138
Int. Cl.[4] B23H *1/00, 7/26*
U.S. Cl. 219—69 R 7 Claims



1. A modular EDM system adapted to support an electrode assembly to move in a controlled fashion, said system comprising:

a base tool adapted to removably and adjustably receive and retain a first accessory tool thereon;

a first accessory tool comprising a swivel spacer adapted to be removably and adjustably mounted on said base tool, said spacer permitting angular adjustment and also being adapted to removably and adjustably receive and retain a second accessory tool thereon; and

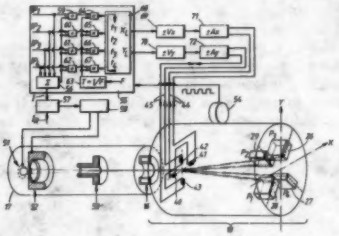
a second accessory tool comprising a servo slide assembly including a frame member adapted to be removably and adjustably mounted on said spacer and a slide member slidably supported on said frame member, said slide member being adapted to removably and adjustably receive and retain the electrode assembly thereon, said slide assembly further including a motor coupled to said slide member and adapted to receive an electrical control signal to controllably move said slide member relative to said frame member along a slide axis wherein said swivel spacer permits angular adjustment of the slide assembly relative to said base tool.

4,638,142
MACHINE FOR ELECTRON-BEAM INTERNAL BUTT WELDING OF TUBES

Xavier F. Puisais, Levallois Perret; Jean-Pierre Hamon, Cergy; Michel Jégousse, Saint-Herblain, and Michel Kaluszynski, Vitry-su-Seine, all of France, assignors to TOTAL Compagnie Francaise des Petroles, Paris, France

Filed Oct. 9, 1985, Ser. No. 785,699
Claims priority, application France, Oct. 22, 1984, 84 16114
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EC 4 Claims

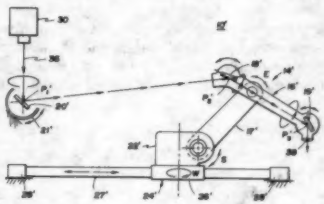
1. A machine for the electron-beam internal welding of two tubes disposed coaxially end-to-end comprising a fixed electron gun for emitting an axial electron beam, deflection means for deflecting said electron beam in the radial direction, and a rotatable support carrying said deflection means and adapted to rotate about an axis coinciding with the axis of said tubes, wherein said rotatable support carries a number n, which is at least equal to two, of said deflection means arranged so as to deflect the electron beam in different radial directions spaced 360/n degrees apart, and, upstream of said deflection means, a deflection system adapted to deliver in a cycle the axial electron beam emitted by said electron gun successively to each of said n deflection means, at a high rate.



4,638,143
ROBOT-LASER SYSTEM

Hadi A. Akeel, Sterling Heights, Mich., assignor to GMF Robotics Corporation, Troy, Mich.

Filed Jan. 23, 1985, Ser. No. 694,031
Int. Cl.[4] B23K *26/00*
U.S. Cl. 215—121 LQ 17 Claims



1. A robot-laser system for providing a laser beam at a desired location, the system comprising:

a laser beam source;

a robot including a plurality of movable parts including a hollow robot arm having a central axis along which the laser source directs the laser beam;

at least one mirror for reflecting the laser beam from the source to the desired location, said mirror being mounted within the robot arm to move therewith and relative thereto to about a transverse axis that extends angularly to the central axis of the robot arm; and

an automatic programmable control system for automatically moving said mirror about said transverse axis relative to and in synchronization with movement of the robot arm to thereby direct the laser beam to the desired location as the arm is moved.

4,638,144
INDEXING LASER MARKER

William A. Latta, Jr., Linesville, Pa., assignor to Automated Industrial Systems, Erie, Pa.

Filed Apr. 24, 1985, Ser. No. 726,706
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LH 24 Claims

1. A machine for marking indicia on plate like articles of manufacture,

said machine (10) comprising:

a frame,

a rotatable turret on said frame,

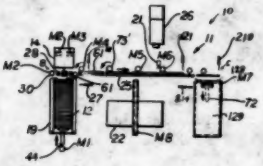
a plurality of spaced magazines supporting means on said turret,

a conveyor extending diametrically of said turret and having a first end and a second end,

a feed station on said frame adjacent said first end of said conveyor,

a loading station and a reloading station on said frame between said feed station and said reloading station for loading magazines onto said turret,

said reloading station being disposed at said frame adjacent said second end of said conveyor for removing



magazines reloaded with marked articles of manufacture,

laser marking means on said frame between said first end of said conveyor and said second end of said conveyor,

indexing means on said frame adapted to index said turret moving said magazines supported on said turret successively from said loading station to said feed station and to said reloading station,

said conveyor being adapted to receive articles from said magazines at said feed station and to move said articles past said laser marking means on said machine at said first end of said conveyor to said reloading station.

4,638,145

LASER MACHINING APPARATUS

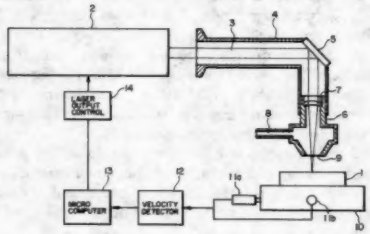
Hisayuki Sakuma, and Susumu Hoshinouchi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 799,686

Claims priority, application Japan, Nov. 20, 1984, 59-244852

Int. Cl.[4] B23K *26/02*

U.S. Cl. 219—121 LU **8 Claims**



1. A laser machining apparatus comprising: a laser oscillator for irradiating a workpiece with laser light, drive means for effecting transverse movement of said laser light relative to said workpiece, a speed detector for determining a relative speed of transverse movement between said laser light and said workpiece from movement of said drive means, optimum laser operating parameter storage means for storing values of laser operating parameters optimum with respect to the speed of transverse movement of said laser light relative to said workpiece and with respect to a material type and thickness of said workpiece, optimum laser operating parameter determining means for determining optimum laser operating parameters in accordance with said relative speed detected by said speed detector and on the basis of a content of said optimum laser operating parameter storage means, and laser operating parameter control means for controlling operating parameters of said laser oscillator according to an output of said optimum laser operating parameter determining means.

4,638,146

METHOD OF PROTECTING EYES FROM WELDING RAYS IN ARC WELDING AND APPARATUS THEREFOR

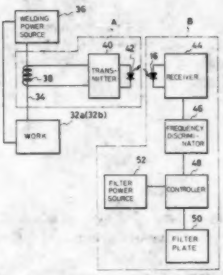
Ario Koyama, Tokyo, Japan, assignor to Nagase Sangyo Kabushiki Kaisha and Kabushiki Kaisha Sensor Gijutsu Kenkyujo, both of, Japan

Filed Oct. 8, 1985, Ser. No. 785,588

Claims priority, application Japan, Oct. 16, 1984, 59-216976

Int. Cl.[4] B23K *9/32*

U.S. Cl. 219—147 **14 Claims**



1. A method of protecting eyes against arc in welding which utilizes a personal eye-protector having a filter plate formed of a material capable of exhibiting an electro-optic effect and arranged thereon, comprising the steps of:

detecting a magnetic field generated around a welding current cable to detect the occurrence of a transient built-up current in a welding current and generating a detection signal; and

controlling a voltage applied to said filter plate depending upon said detection signal;

occurrence of said magnetic field being detected by a magnetic field detector provided on an electrode holder; and

said detection signal being converted into a light signal or wave signal of a predetermined frequency and being received by a receiver provided at a position of said eye-protector.

4,638,147

MICROPROCESSOR CONTROLLED THROUGH-FLOW ELECTRIC WATER HEATER

Anthony Dytch, 3 Brompton Lawns, Mill Lane, Tettenhall, Wolverhampton, West Midlands; Andrew Keatley, 21 The Leasow, Aldridge, Walsall, West Midlands, and William Wright, 13 Boscobsel Road, Walsall, West Midlands, all of United Kingdom

Filed Oct. 17, 1984, Ser. No. 661,903

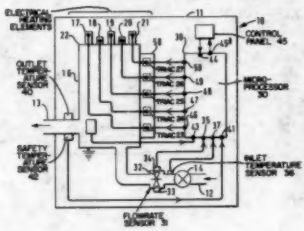
Claims priority, application United Kingdom, Oct. 18, 1983, 8327865

Int. Cl.[4] H05B *1/02*; F24H *1/10*

U.S. Cl. 219—308 **8 Claims**

1. A water heater comprising a water inlet and a water outlet, passage means between said water inlet and outlet to permit a continuous flow of water from the inlet to the outlet, means to heat the water as it flows from the inlet to the outlet, the heating means comprising first electrical heating means comprising a plurality of heating elements and second electrical heating means comprising at least one heating element, means being provided to switch each of said heating elements of the first electrical heating means on and off in different

combinations in response to a control means to achieve different levels of heat dissipation to the flowing water by the first electrical heating means, means to burst fire said at least one heating element of the second electrical heating means to vary the heat dissipated to the flowing water by the second electrical heating means between maximum and minimum heating



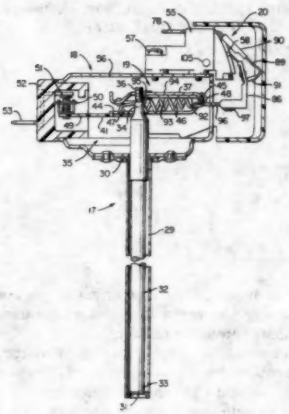
levels, the control means switching the at least one heating element of second electrical heating means on with at least some of the different combinations of heating elements of the first electrical heating means, and controlling the level of heat dissipation by the first and second electrical heating means to achieve a desired total level of heat dissipation.

4,638,148

CONTROL SYSTEM AND CONTROL DEVICE FOR CONTROLLING A HEATING UNIT AND METHOD OF MAKING THE SAME

Harvey J. Shopsky, Latrobe, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 534,340, Sep. 21, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,889
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **18 Claims**



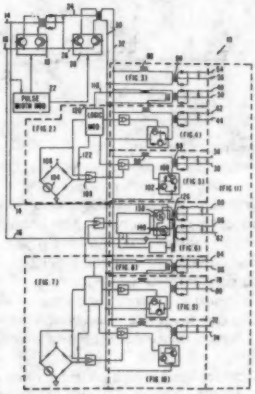
1. In a control device having a rod and tube temperature sensing unit for providing linear motion of a part thereof along a substantially straight linear path in relation to the temperature being sensed by said unit and having a potentiometer means provided with an electrical output producing means operatively interconnected to said part of said unit so as to produce a variable electrical signal in relation to the temperature being sensed by said unit, said electrical output means being movable along an arcuate linear path by said part of said unit, said potentiometer means having a member provided with an arcuate electrical resistance means having a wiper contacting face, said electrical output means comprising an electrical wiper means being disposed in sliding engagement with said wiper contacting face whereby said arcuate electrical resistance means defines said arcuate path, said control device having movable interconnecting means operatively interconnecting said part of said unit to said electrical output means of said potentiometer means, said movable interconnecting means comprising a pivotally mounted lever, said lever having a pivot point, said electrical output means being carried by said lever to move in unison therewith whereby said arcuate path is defined by a radius extending from said pivot point of said lever to said electrical output means of said potentiometer means, the improvement wherein said linear path of said electrical output means and said linear path of said part of said unit are substantially coplanar and said wiper contacting face of said potentiometer means is convex and is also defined by a radius extending from said pivot point of said lever to said wiper contacting surface of said potentiometer means and wherein said member is movable relative to said device along an arcuate path that is substantially concentric to said arcuate path of said electrical output means for calibrating said device.

4,638,149

POWER-PROCESSING UNIT

Frank J. Wessel, Santa Monica, and Donald J. Hancock, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 27, 1983, Ser. No. 507,659
Int. Cl.[4] H05B *1/02*; H02P *13/24*
U.S. Cl. 219—499 **11 Claims**



1. A power-processing unit comprising:

a pair of alternating current buses for connection to supply alternating current power;

a plurality of power supply circuits each consisting of a serially connected inductor and a transformer primary connected between said buses, said circuits each also comprising a transformer secondary magnetically coupled to each said transformer primary, a rectifier connected to each said transformer secondary so that each of said secondaries can be connected to a load in an ion thruster for supplying a current limited direct current thereto;

at least one serially connected second inductor, second transformer primary and switch connected between said buses, a second transformer secondary magnetically coupled to said second transformer primary and second rectifiers connected to said second transfomer secondary to supply a current limited load, a temperature sensor connected to said switch to control said switch in accordance with sensed temperature of the load so that the load connectable to said second transformer secondary is current

limited and powered in accordance with sensed temperature;

a pair of unregulated DC buses for connection to a substantially unregulated DC source and connected thereto is a DC to DC regulator for providing current at a substantially constant voltage and connected thereto is a DC to AC inverter for supplying alternating current at a substantially fixed frequency and voltage, said alternating current buses being supplied by said DC to AC inverter; and

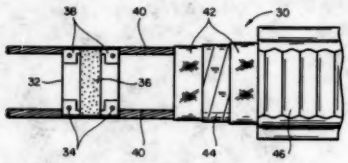
including a high voltage power supply having separate transformer secondaries for connection to a screen and an accelerator electrode of the ion thruster for applying potential thereto, said high voltage supply receiving power from said unregulated DC buses and having a high voltage transformer primary therein, said primary being connected to said buses through a pulse width modulated switch so that the output voltages of both said high voltage secondaries are controlled.

4,638,150

MODULAR ELECTRICAL HEATER

Wells Whitney, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 19, 1984, Ser. No. 632,776
Int. Cl.[4] H05B *3/16*
U.S. Cl. 219—543 **20 Claims**



1. A heater comprising

(1) a pair of flexible elongate parallel conductors which are connectable to a power supply;

(2) a plurality of rigid heating modules connected in parallel with each other between the conductors, each of said heating modules being physically spaced apart from each of the conductors and comprising

(a) a rigid insulating substrate; and

(b) a resistive heating component which has been deposited on the substrate and which generates heat when the conductors are connected to a suitable power supply; and

(3) electrical leads which physically and electrically connect the modules to the elongate conductors, the portions of each of the leads which are not connected either to a module or to a conductor having a tension and torsion modules of elasticity less than 10^8 psi and an aspect ratio greater than 0.5, where the aspect ratio is defined as length/diameter of the lead and the diameter is an equivalent diameter; wherein the quantity

$$-\mathrm{Log}\left[\frac{1}{d}\ \frac{F}{ED^2}\right]$$

is not more than 6,

where

l=length of lead;

d=equivalent diameter of lead;

E=modulus of elasticity of the elongate parallel conductors;

D=equivalent diameter of the elongate parallel conductors; and

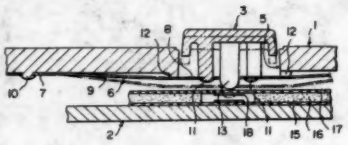
F=minimum force required to break the bond between lead to module.

4,638,151

KEYBOARD OF AN ELECTRONIC APPARATUS

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,194
Claims priority, application Japan, May 25, 1984, 59-105719; May 25, 1984, 59-105720; May 25, 1984, 59-105721
Int. Cl.[4] G06C *7/02*
U.S. Cl. 235—145 R **7 Claims**



1. A keyboard for an electronic apparatus comprising:

a plurality of keytops for inputting information;

a frame having opening portions to expose said plurality of keytops from the inside of the electronic apparatus to the outside; and

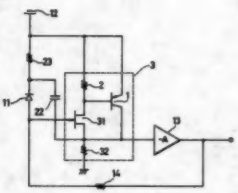
a spring member elastically supporting said plurality of keytops, wherein said spring member is fixed to said frame and includes a single flat and thin plate and said frame includes stopper portions projected near said opening portions for contacting said spring member to cause said spring member to be deformed.

4,638,152

PHOTOELECTRIC CONVERTING CIRCUIT HAVING A LOW PARASITIC CAPACITANCE

Hisashi Takada, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 13, 1985, Ser. No. 797,500
Claims priority, application Japan, Nov. 13, 1984, 59-239095
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 A **1 Claim**



1. A bootstrap photoelectric converting circuit comprising:

a light receiving element with a first end connected to a power supply through a resistor,

a field effect transistor (FET) coupled in source follower arrangement, having a gate input terminal connected to a second end of said light receiving element,

an inverting amplifier for inversely amplifying the output of said FET,

a feedback resistor coupling an output of said inverting amplifier to the gate input of said field effect transistor,

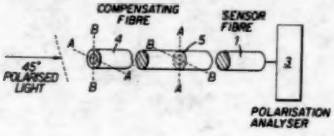
a capacitor for applying an a.c. output signal component of said FET to one end of said light receiving element, and

a bipolar transistor connected complementary to said FET to cause said amplifier to have a substantially unity gain and a small output impedance to reduce the influence of capacitance parasitic on said light receiving element on the frequency characteristics of said photoelectric converting circuit.

4,638,153
OPTICAL FIBRE SENSING ARRANGEMENTS

John P. Dakin, Burridge, England, assignor to Plessey Overseas Limited, Ilford, England

Filed May 18, 1984, Ser. No. 611,998
Claims priority, application United Kingdom, May 26, 1983, 8314570
Int. Cl.⁴ H01J 5/16
U.S. Cl. 250—227 8 Claims

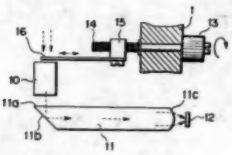


1. An optical arrangement suitable for the detection of acoustic waves and/or temperature or magnetic field changes, comprising means for producing polarised light which in operation of the arrangement will be applied for detection purposes to the input end of an optical sensor for transmission therethrough, whereby a relative phase delay is produced between orthogonal components of the polarised light at the output end of the optical sensor, and relative phase delay compensation means optically coupled to and so orientated with respect to one end of the sensor, that the relative phase delay between the orthogonally polarised components transmitted through the compensation means and the corresponding relative phase delay in the optical sensor are mutually opposite, thereby reducing the noise content of an output signal derived from the arrangement and fed to polarisation analyser means for producing an indication of structural changes which have occurred in the optical sensor.

4,638,154
REFLECTION-TYPE PHOTOELECTRIC SWITCHING APPARATUS WITH LIGHT-ADJUSTABLE REFERENCE LIGHT DETECTION

Fumiaki Itsuki, Nagaokakyo, and Seiji Oku, Osaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 238,703, Feb. 27, 1981, abandoned.
This application Dec. 20, 1983, Ser. No. 563,642
Claims priority, application Japan, Mar. 15, 1980, 55-32878
Int. Cl.⁴ H01J 5/16
U.S. Cl. 250—227 6 Claims



1. In a reflection-type photoelectric switching apparatus having a light projecting element for projecting light rays to an object, a detection light receiving photoelectric element for receiving reflected light rays from said object, a circuit device for processing output signals from said detection light receiving element, and a housing for enclosing at least said light projecting and detection light receiving elements and circuit device,

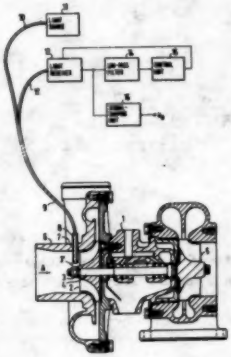
the improvement comprising a reference light receiving photoelectric element disposed adjacent to said detection light receiving element, said reference light receiving element and said detection light receiving element being reversely connected with respect to each other such that the output of one of said elements cancels the output of the other of said elements, and a reference light path including conducting means for guiding some of said light rays projected from the light projecting element to said reference light receiving element, and

means for adjusting a quantity of light rays guided by said reference light conducting means to a predetermined quantity whereby the resultant output of said reversely connected photoelectric elements can be adjusted to a desired quantity.

4,638,155
OPTOELECTRONIC MEASURING DEVICE

Konrad Dorr, Leonberg, Fed. Rep. of Germany, assignor to Dr.Ing.h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 692,985
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401858
Int. Cl.⁴ G01D 5/34
U.S. Cl. 250—231 SE 14 Claims



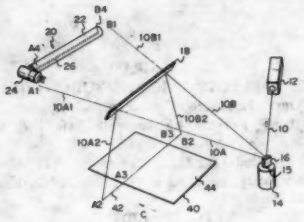
1. An apparatus for the optoelectronic measuring of the speed of a shaft, especially of a turbosupercharger shaft, comprising: a light modulator affixed to the shaft, a light source, and a light receiver component having an evaluating electronic system connected to its outlet side, a pencil of light guiding means having a first and second end for the optical transmission of signals, the pencil of light guiding means consisting essentially of several individual fibers and, at its second end facing away from the light modulator, being split into two approximately equal halves for the coupling-in of light from the light source and the coupling-out of light to the light receiver component, the light modulator consisting of a component already existing on the shaft which over its circumference has varying degrees of reflection and reflects the light in a radial direction, and wherein the light receiver component includes a phototransistor for receiving coupled-out light, the emitter (E) of which is connected to a negative distribution voltage, and the collector of which is connected to a positive distribution voltage by means of a changeable collector resistance that is controlled by a low-pass filter having an integral control unit connected to its outlet side and is switchably connected to a ground potential, and the collector being additionally connected to a signal shaping unit for obtaining a processable alternating signal of a frequency that is proportional to the rotational speed.

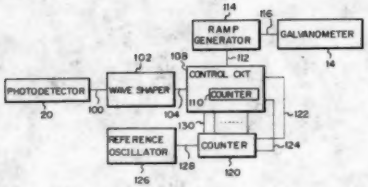
4,638,156

LIGHT BEAM SCANNING APPARATUS WITH ADJUSTABLE SCANNING SPEED AND OFFSET

Kazuo Horikawa, and Yuji Ohara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 543,558, Oct. 19, 1983, abandoned. This application Jun. 9, 1986, Ser. No. 873,300
Claims priority, application Japan, Oct. 19, 1982, 57-182172
Int. Cl.[4] G02B *26/10*; H01J *3/28*
U.S. Cl. 250—235 **6 Claims**





1. A light beam scanning apparatus comprising:

means for sweeping a light beam in response to a ramp signal;

means for dividing the swept light beam into first and second portions, said first portion being directed onto a medium to be scanned;

an optical grating disposed in the path of said second portion and extending in a direction of sweep of said second portion;

light detecting means receiving light passing through said optical grating for producing a detection signal having a pulse for each time said second portion crosses a line of said grating;

a reference oscillator for producing reference clock pulses having a frequency greater than a frequency of said pulses of said detection signal;

a first counter for counting said reference clock pulses;

a second counter for counting said pulses of said detection signal; and

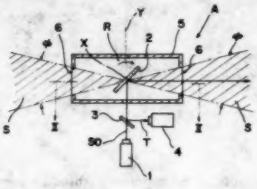
control means for enabling said first counter to count said reference clock pulses when said second counter has reached a first predetermined count of said pulses of said detection signal and disabling said first counter from counting said pulses of said detection signal when said second counter has reached a second predetermined count of said pulses of said detection signal, said first and second predetermined counts corresponding to boundaries of a reference region along said grating, and adjusting a slope of said ramp signal in response to a count reached by said first counter when said second counter has reached said second predetermined count to thereby maintain a scan speed of said beam substantially constant.

4,638,157

DETECTING APPARATUS UTILIZING LIGHT BEAMS

Hiroshi Tatsumi, Fujiidera, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Oct. 12, 1984, Ser. No. 660,352
Claims priority, application Japan, May 11, 1984, 59-95401
Int. Cl.[4] H01J *3/14, 5/16, 40/14*
U.S. Cl. 250—236 **10 Claims**



1. An apparatus for detecting an object by utilizing a light beam comprising

a light beam source for emitting a light beam,

a light beam receiving means,

reflecting means for reflecting the light beam emitted from the light beam source and directing said light beam along a light path onto a retroreflector means provided on said object to be detected for reflecting an incident light beam in a predetermined direction,

drive means for rotating said reflecting means on an axis (X) normal to an optical axis (Y) of said light beam emitted from the light beam source, and

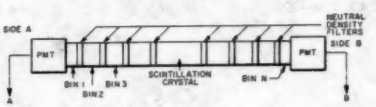
slits (6) provided in light beam exit portions to determine a scanning angle by said light beam reflected by the reflecting means.

4,638,158

GAMMA RAY MEASUREMENT OF EARTH FORMATION PROPERTIES USING A POSITION SENSITIVE SCINTILLATION DETECTOR

Darrell S. Sonne, Katy, and William J. Beard, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 18, 1984, Ser. No. 571,897
Int. Cl.[4] G01V *5/00*; G01T *1/20*
U.S. Cl. 250—266 **8 Claims**



1. A system for measuring properties of earth formations in the vicinity of a well borehole at a plurality of different radial distances from the borehole, comprising:

a fluid tight hollow body member sized and adapted for passage through a well borehole and housing therein;

a source of gamma rays and means for directing gamma rays from said source outwardly from said body member into earth formations in the vicinity of the borehole; and

a position sensitive scintillation detector for detecting gamma rays scattered back into said body member from the earth formation in the vicinity of the borehole, means for collimating said scattered gamma rays onto said detector, said detector comprising scintillation crystal means having a plurality of discrete longitudinally spaced active regions or bins and being longitudinally spaced from said gamma ray source and having a longitudinal length L and two opposite ends and having photomultiplier tubes optically coupled to said opposite ends for providing output

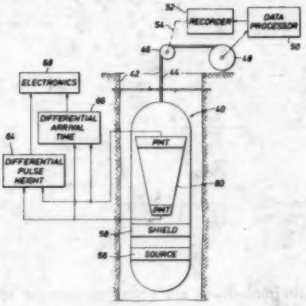
voltage signals having voltage amplitudes A and B representative of the intensity of scintillation events occurring in said crystal and impinging at said opposite ends thereof, means separating said bins for selectively attenuating light passing therebetween, and means for combining said output voltage signals A and B according to a predetermined relationship to derive the discrete bin along said length L of each of said scintillation events in said crystal, thereby providing measurements of the gamma ray scattering properties of the earth formations at different radial distances from the borehole.

4,638,159

GRADED SHAPED SPATIAL RESOLUTION NUCLEAR DETECTORS

Allen Nunley, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 27, 1985, Ser. No. 716,887
Int. Cl.[4] G01V *5/08*; G01T *1/20*
U.S. Cl. 250—267 **12 Claims**



1. For use in a sonde adapted to be lowered into a well borehole to conduct well logging operations by the observation of nuclear events impinging on the apparatus, a nuclear event scintillation detector having a specified size and shape between two spaced ends, one end being a near end and the other end being a far end, the cross section increasing monotonically along the detector from the near end to the far end to define a bias along the length thereof wherein the bias opposes a bias in spatial distribution of nuclear events measured by such a detector wherein the increase modifies nuclear event distribution in the detector within upper and lower scintillation count limits, and wherein said scintillation detector is constructed and arranged to receive nuclear events from any direction to create scintillations therein.

4,638,160

HIGH CLARITY MASS SPECTROMETER CAPABLE OF MULTIPLE SIMULTANEOUS DETECTION

Georges Slodzian, Sceaux; Francois Costa De Beauregard, Paris; Bernard Daigne, Chatenay Malabry, and Francois Girard, Paris, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales (ONERA), Chatillon and Universite de Paris-sud, Orsay, both of, France

Filed Jan. 28, 1985, Ser. No. 695,240
Claims priority, application France, Jan. 27, 1984, 84 01332
Int. Cl.[4] H01J *49/32*
U.S. Cl. 250—296 **12 Claims**

1. A mass spectrometer, comprising:

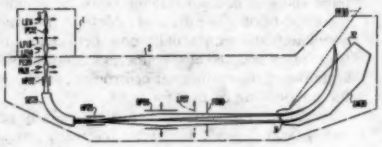
inlet means for receiving a beam of charged particles having horizontal trajectory components in a radial plane and vertical trajectory components transverse to said radial plane;

first deflection means for impinging a first deflection, in the radial plane, to the beam of particles received from said inlet means, said first deflection varying with the velocity of the particles;

correcting means, arranged on the path of the particle beam, for compensating for second order aperture aberrations of said first deflection means for trajectories in the radial plane;

beam shaping means for independently adapting the horizontal and vertical trajectory components of the beam received from said first deflection means to provide a parallel beam having a thin vertical section transverse to said radial plane, and for passing the parallel beam through an aperture slot; and

second deflection means for impinging a second deflection, in the radial plane, to the beam of particles received from said aperture slot, said second deflection varying with



both the mass and energy of the particles, and the energy dependent component of the second deflection being substantially compensated for by said first deflection in the first deflection means,

said second deflection means having a planar inlet face inclined by an angle ϵ, with respect to a normal to the axis of the particle beam incident thereon, in the direction of the deflection in said second deflection means, and having a planar outlet face in a plane passing through the intersection of the inlet face and the axis of the particle beam, so that the following equation is satisfied

$$\tan(\theta/2)\tan(\theta-\epsilon)=2,$$

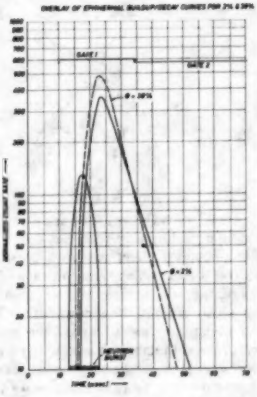
where θ designates the angle of deflection of the beam in said second deflection means.

4,638,161

EPITHERMAL NEUTRON POROSITY MEASUREMENT

Harry D. Smith, Jr., and Jerry L. Verboot, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 24, 1983, Ser. No. 544,039
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—269 **6 Claims**



1. A method for determining the porosity of earth forma-

tions in the vicinity of a well borehole passing therethrough, comprising:

(a) emitting, in a portion of the borehole substantially adjacent the formations of interest, repetitive relatively short duration with respect to a typical epithermal neutron decay time constant pulses of fast neutrons for moderation to epithermal energies by interaction with nuclei of materials in the borehole and surrounding earth formations, creating thereby repetitive bursts of populations of epithermal neutrons in the borehole and surrounding earth formations,

(b) detecting epithermal neutrons at a longitudinally spaced distance in the borehole during at least two non-overlapping predetermined time intervals, comprising a first interval substantially spanning the build-up of the epithermal neutron population and including each such fast neutron pulse and a second interval substantially spanning at least a portion of only the die-away of the epithermal neutron population and substantially only between said fast neutron pulses, said detected epithermal neutrons being representative of the epithermal neutron population in at least the surrounding earth formations,

(c) generating at least two count rate signals by generating, during said at least two time intervals, corresponding count rate signals representative of the corresponding said epithermal neutron populations,

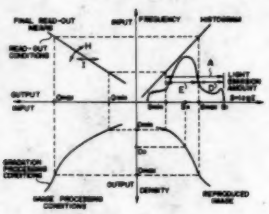
(d) obtaining a measurement signal representative of the porosity of the surrounding earth formations by taking a ratio of the count rate signal during said first time interval to the count rate signal during said second time interval to improve the statistical formation measurements by utilizing data from both the epithermal neutron population build-up and the die-away, said count rate signal during said first time interval being due primarily to epithermal neutron population build-up, and

(e) recording said measurement signal as a function of borehole depth.

4,638,162
METHOD OF ADJUSTING RADIATION IMAGE READ-OUT CONDITION

Hiroshi Tanaka, and Tokukazu Saito, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Mar. 5, 1985, Ser. No. 708,767
Claims priority, application Japan, Mar. 5, 1984, 59-42260
Int. Cl.⁴ G01T 1/105
U.S. Cl. 250—327.2 **8 Claims**



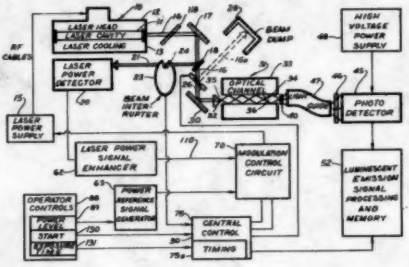
1. A method of adjusting radiation image read-out conditions in which preliminary read-out conducted by scanning a stimulable phosphor sheet carrying a radiation image of an object stored therein by stimulating rays of a level lower than the level of the stimulating rays used in final read-out and obtaining a histogram of the amount of the light emitted by the stimulable phosphor sheet is carried out prior to the final read-out wherein the stimulable phosphor sheet is scanned by stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the radiation energy stored and detecting the emitted light by a photoelectric read-out means to obtain an image signal, and read-out conditions in the final read-out are adjusted on the basis of the histogram obtained by the preliminary read-out,

wherein the improvement comprises adjusting the read-out conditions on the basis of a histogram section ranging from the maximum light emission amount in the histogram obtained by the preliminary read-out to a value offset from said maximum amount by an offset value determined by image recording conditions.

4,638,163
METHOD AND APPARATUS FOR READING THERMOLUMINESCENT PHOSPHORS

Peter F. Braunlich, SW. 730 City View, Pullman, Wash. 99163, and Wolfgang Tetzlaff, Pullman, Wash., assignors to Peter F. Braunlich, Pullman, Wash.

Filed Sep. 20, 1984, Ser. No. 652,829
Int. Cl.⁴ G01T 1/115
U.S. Cl. 250—337 **15 Claims**



1. A thermoluminescent phosphor reading apparatus for reading the level of ionization existing in a thermoluminescent phosphor as a result of exposure of the phosphor to ionizing radiation, comprising:

laser beam source means for generating and emitting a laser beam; said laser beam source means being capable of modulation to control power of the laser beam;

laser beam power detection means for measuring the power of the laser beam at least once during an exposure period during which the laser beam is directed upon the thermoluminscent phosphor;

phosphor positioning means for holding the thermoluminescent phosphor in position to be exposed to the laser beam;

laser power control means for rapidly and adjustably modulating the power output of the laser beam source means to maintain the power of the emitted laser beam at a desired level;

shutter means positioned to control exposure of the thermoluminescent phosphor held by the phosphor positioning means, without interfering with operation of the laser beam power detection means; and

thermoluminescent emission measuring means for measuring the output of any thermoluminescent emission occurring when the thermoluminescent phosphor is heated by the laser beam.

4,638,164
HIGH RESOLUTION SCINTILLATION CRYSTAL

Darrell S. Soane, Katy, and Allen Nunley, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

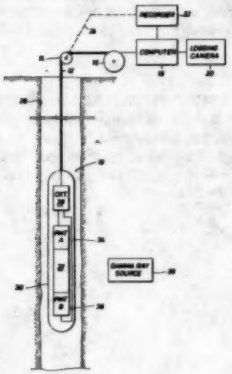
Filed Oct. 17, 1984, Ser. No. 661,636
Int. Cl.⁴ G01V 5/06; G01T 1/208, 1/202
U.S. Cl. 250—366 **7 Claims**

1. A scintillation detector for well logging usage and responsive to a gamma ray passage for providing a compensated output signal having a specified energy range comprising:

(a) a single elongated scintillation crystal having specified

physical configuration including two ends longitudinally spaced apart, said crystal converting a gamma ray passage event into a light emission having an origin within said crystal and wherein the light emission is attenuated by said crystal during light transmission to each of said end portions;

(b) first and second photomultiplier tubes optically coupled



to said end portions of said crystal for forming electrical signals output on detection of the light emission; and

(c) circuit means connected to said first and second photomultiplier tubes for receiving the signals therefrom, said circuit means forming an output signal representative of the energy of the gamma ray passage event including a portion thereof compensating for the light emission lost by attenuation in said crystal means.

4,638,165

DETECTOR APPARATUS AND METHOD FOR COMPUTER TOMOGRAPHY AND RADIOGRAPHY

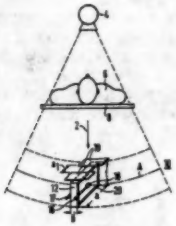
Peter Glasow, and Wolfgang Rühle, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,352

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408681

Int. Cl.⁴ G01T *1/22*

U.S. Cl. 250—370 **12 Claims**



1. A detector system operable without cooling for ionizing rays for computer tomography or computer radiography comprising a plurality of flat detectors which are arranged with their flat sides alongside each other and a narrow side of which is provided for the reception of the ionizing rays, each flat side being provided with an electrode, with one of said electrodes including a blocking junction disposed thereon, the detectors being of high purity germanium and having a particular volume such that the contribution of generation-recombination current to shot noise of the detectors is substantially smaller than the quantum noise of the rays, with the system operating at or below room temperature.

4,638,166

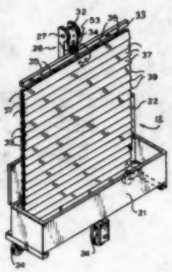
RADIATION SHIELD

Thomas O. Baudro, Gales Ferry, Conn., assignor to Proto-Power Corporation, Groton, Conn.

Filed Mar. 1, 1985, Ser. No. 707,070

Int. Cl.⁴ G21F *3/00*

U.S. Cl. 250—515.1 **23 Claims**



1. A vertically collapsible radiation shield device including a shield adapted to be moved between a first raised condition and a second collapsed condition, flexible suspension means for raising and lowering said shield; said shield including a plurality of overlapping horizontally elongated slats of radiation shielding material, each of which is individually attached near its top edge to said suspension means so that said slats are individually suspended at spaced intervals along the suspension means.

4,638,167

INSULATOR CIRCUIT WITH AN OPTOELECTRONIC COUPLER

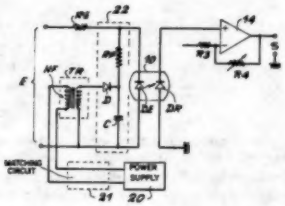
Jean-Yves Leseure, 7A rue PaPu, Rennes 35000; Charbonnel Pierre, and Christian Laure, both of Betton, all of France, assignors to Jean-Yves Leseure, Rennes and Etablissement Public de Diffusion Dit "Telediffusion de France" , Montrouge, both of, France

Filed Sep. 19, 1984, Ser. No. 652,306

Claims priority, application France, Sep. 20, 1983, 83 14920

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 250—551 **5 Claims**



1. An insulator circuit comprising an optoelectronic coupler consisting of a photoemitting diode positioned facing a photodetector, a photoemitting diode polarizing circuit, an audiofrequency signal input connected to the photoemitting diode and an output amplifier connected to the photodetector, wherein the photoemitting diode polarizing circuit comprises a high frequency power supply, said high frequency being in the

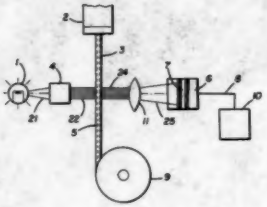
range 2-20 MHz, a high frequency transformer connected to said power supply, and a rectifier circuit with two inputs connected to said transformer and two outputs connected to said photoemitting diode.

4,638,168

APPARATUS FOR MEASUREMENT OF HOLLOW FIBER DIMENSIONS

Dean F. Marino; William E. Ryan, both of Antioch, and Arthur J. Kamp, Oakley, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1984, Ser. No. 664,277
Int. Cl.[4] G01B *11/12*
U.S. Cl. 250—560 **21 Claims**



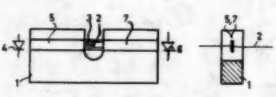
1. An apparatus for measurement of both the outside and inside diameter of a non-opaque hollow fiber comprising:
(a) at least one photosensitive detector for measuring differential light absorption of a non-opaque hollow fiber in a dimension generally pependicular to the fiber's axis;
(b) an incoherent light source which can project light on the photosensitive detector;
(c) a means for positioning the fiber to be measured so an image of light from the incoherent source which is transmitted through the fiber is projected on the photosensitive detector; and
(d) means for relating the differential light absorption to outside and inside dimensions of the hollow fiber.

4,638,169

MEASURING DEVICE FOR MEASURING THE CROSS-SECTION OF TEXTILE YARNS

Christof Thomann, Maur, Switzerland, assignor to Zellweger Uster, Ltd., Uster, Switzerland

Filed Sep. 26, 1984, Ser. No. 654,460
Claims priority, application Switzerland, Oct. 4, 1983, 5392/83
Int. Cl.[4] G01B *11/02, 11/08*
U.S. Cl. 250—560 **12 Claims**



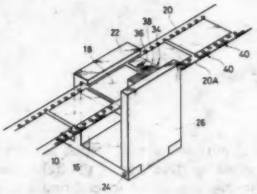
1. A device for measuring the cross-section of textile yarns, comprising:
a light source including means for projecting a band of light through a measuring field in which the textile yarn whose cross-section is to be measured may be disposed so as to intercept said band of light;
means disposed between said light source and said measuring field for homogenizing said band of light prior to its passage through said measuring field so that the shadow produced by said yarn as it intercepts said band of light does not change in size with a change of position of the yarn, including a first light guide having reflecting surfaces which subject light passing through the light guide to multiple reflections and having an elongated shape with a length greater than the longest dimension of its cross-section;
light receiver means for detecting the light passing through said measuring field from said light source and for generating a signal indicative of the cross-section of said yarn; and
a second light guide disposed between said measuring field and said light receiver means to conduct said light from said measuring field to said light receiver means.

4,638,170

METHOD OF READING BAR CODE

Kazufumi Kubota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 15, 1985, Ser. No. 712,065
Claims priority, application Japan, Mar. 16, 1984, 59-051757; Mar. 16, 1984, 59-051758
Int. Cl.[4] G06K *7/10*
U.S. Cl. 250—566 **21 Claims**



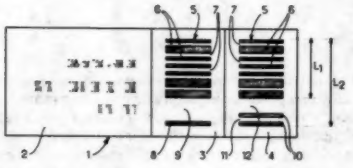
1. A method of reading a bar code formed on an object subjected to information detection, comprising the steps of:
(a) detecting the pattern of light and dark portions of said bar code using a detecting means which includes a plurality of pattern detecting members disposed in the bar code reading direction, at least two of said detecting members being confined within the widthwise dimension of a single clock bar of said bar code and being disposed in the bar code reading direction;
(b) determining the type of light and dark pattern detected by said detecting means; and
(c) determining the direction of advancement of said bar code relative to said pattern detecting members in accordance with the direction of change of said pattern of light and dark portions, thereby obtaining the position of a clock bar code relative to said detecting members.

4,638,171

METHOD AND DEVICE FOR THE DETECTION OF THE POSITION OF OBJECTS STACKED ON PALLETS

Max Gassmann, l'Etang la Ville, France, assignor to L'Oreal, Paris, France

Filed Mar. 19, 1984, Ser. No. 590,761
Claims priority, application France, Mar. 25, 1983, 83 04992
Int. Cl.[4] G06K *7/10*
U.S. Cl. 250—566 **20 Claims**



1. In a method for detecting the position of identical parallel-piped-shaped objects and for transferring them by automatic

transfer means from a first receptacle to at least one other receptacle, wherein each of the said objects carries a position marker carrier having at least two adjacent flat label sections, each of which label sections is provided with a target mark for optical reading, one part of the target mark having a predetermined length, and being displayed on a respective one of two adjacent sides of the object, one of the sides being a large side delimited by the length and height of the object and the other side being a small side delimited by the width and the height of the object, the objects having been stored on each first receptacle so that, as regards each one of them, one of the label sections of the corresponding marker carrier is substantially parallel to a reference side of the first receptacle on which this object is stored,

the improvement wherein, for each said object the following steps are carried out:

(a) the said predetermined length part of the target mark of the label section which is substantially parallel to the reference side of the first receptacle is scanned at least once with an optical reading bean emitted by a light source and displaced at a constant speed,

(b) the scanning time T of the predetermined length part is measured, and

(c) the distance separating the light source from the respective side of the object is calculated from the predeterminted length, the constant scanning speed, and the measured time.

4,638,172

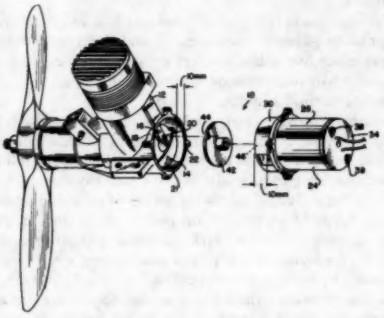
COMBINATION, A MODEL VEHICLE ENGINE AND A DIRECT-CURRENT GENERATOR

George A. Williams, 16 Grant St., Dover, N.J. 07801

Filed Nov. 27, 1984, Ser. No. 675,227

Int. Cl.[4] H02K *7/18*

U.S. Cl. 290—1 R **15 Claims**



1. In combination, an engine for a model vehicle, such as a model airplane or the like, and a direct-current generator, comprising:

an internal-combustion engine; and

a direct-current generator operatively coupled to said engine; wherein

said generator comprises an armature, and a drive coupling member drivingly engaged with said armature;

said armature has three poles;

each of said poles has not less than six hundred turns of magnetic wire;

said engine having first means comprising a crankshaft, and second means comprising a connecting rod; and

one of said first and second means has means for drivingly engaging said drive coupling for imparting rotation to said generator from said engine.

4,638,173

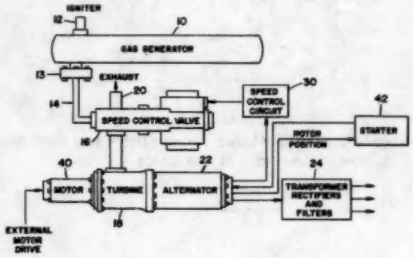
ELECTROMECHANICAL POWER SOURCE

Ronald I. Milton, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1985, Ser. No. 733,834

Int. Cl.[4] H02K *21/12*

U.S. Cl. 290—52 **7 Claims**



1. An electromechanical power source for aerospace vehicles which comprises:

(a) a solid propellant gas generator;

(b) a turbine coupled to be driven by gas from said solid propellant gas generator;

(c) an alternator coupled to be driven by said turbine;

(d) means for measuring an output parameter of said alternator;

(e) gas flow control valve for controlling the gas flow between said gas generator and said turbine, said gas flow control valve being an electromagnetically controlled flapper valve having a first gas output coupled to the input of said turbine, a second gas output coupled to an exhaust means and a gas input; and

(f) control means for comparing said output parameter of said alternator with the required value of said parameter, said control means being coupled to control said gas flow control valve to adjust the gas flow to drive said output parameter to the required value, said control means being coupled to control said flapper valve to couple said gas flow to said turbine when the value of said parameter is lower than the required value of said parameter and to control said flapper valve to couple said gas flow to said exhaust means when the value of said parameter is higher than the required value of said parameter.

4,638,174

SWITCHING DEVICE FOR LIGHTING THE INTERIOR OF A MOTOR VEHICLE

Axel Bier, Gundelsheim, Fed. Rep. of Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

PCT No. PCT/DE84/00057, § 371 Date Feb. 25, 1985, § 102(e) Date Feb. 25, 1985, PCT Pub. No. WO84/03670, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 14, 1984, Ser. No. 685,453

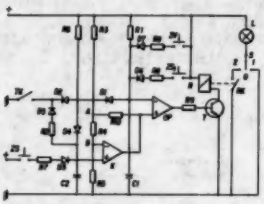
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309548

Int. Cl.[4] B60Q *3/02*

U.S. Cl. 307—10 LS **3 Claims**

1. Switching device used in the interior lighting of a motor vehicle provided with an ignition lock and a battery, with a timing element that is controlled by a door contact switch, which is opened when a door of the vehicle is closed, and that permits the interior lighting to be left switched on for a first specified time after the door is closed, characterized in that a second timing element (C2 R2) is provided, which is controlled by closing the door contact switch (TK) and which turns off the interior lighting (L) after a second specified time

when the ignition switch (ZS) is open and the door contact switch (TK) remains closed wherein said second specified time



is selected to prevent discharge of said battery to a level hindering ignition of the engine of said motor vehicle.

4,638,175

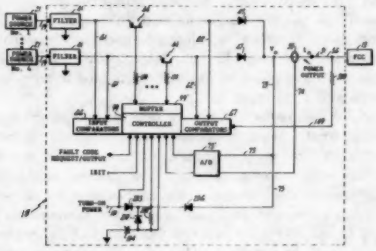
ELECTRIC POWER DISTRIBUTION AND LOAD TRANSFER SYSTEM

Michael P. Bradford, Orange; Gerald W. Parkinson, and Ross M. Grant, both of Shelton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1984, Ser. No. 627,706

Int. Cl.[4] H02J 7/00

U.S. Cl. 307—64 **2 Claims**



1. A power distribution system, comprising:

at least two switch means for controlling the application of power from a plurality of power sources, to a power output;

at least two current means for preventing reverse power flow through respective ones of said plurality of switch means; and

processing means for providing control signals to operate said switch means, effective to switch respective ones of said power sources between on and off states with respect to said power output; characterized by:

first voltage detection means for detecting the levels of first voltages at a first side of corresponding ones of said switch means;

first comparator means for comparing the voltages detected by said first voltage detection means to selected upper and lower voltage thresholds and for providing a signal indication of an abnormal voltage condition to said processing means when any of said first detected voltages are at a level not within the bounds of said upper and lower voltage thresholds, said processing means responding to said abnormal signal indicator such that power sources are selectively switched with respect to said power output in view of any abnormal voltage conditions.

4,638,176

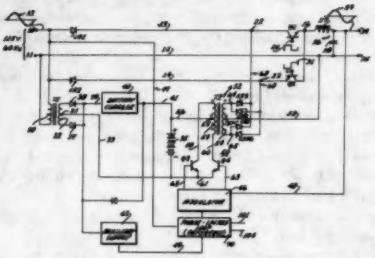
UNINTERRUPTIBLE POWER SUPPLY

Robert M. Martinelli, Torrance, Calif., assignor to Mullett Associates, Inc., Los Angeles, Calif.

Filed Aug. 1, 1985, Ser. No. 761,471

Int. Cl.[4] H02J 9/00

U.S. Cl. 307—64 **9 Claims**



1. An uninterruptible power supply system for supplementing a utility power supply with an auxiliary power supply when the utility power fails, said system comprising:

an input terminal having input sinewaves of said utility power supplied thereto;

an output terminal for supplying output sinewaves to a load;

a plus d.c. line and minus d.c. line connected to said input terminal;

rectifying means in said plus d.c. line and said minus d.c. line responsive to input sinewaves on said input terminal to provide positive half sinewaves on said plus d.c. line and negative half sinewaves on said minus d.c. line;

a plus d.c. bus and a minus d.c. bus;

said auxiliary power supply including means responsive to output sinewaves on said output terminal for detecting the loss in amplitude of the output sinewaves when the utility power supply partially fails to drive said auxiliary power supply and including rectifying means to provide positive going bursts of varying width pulses whose duty cycles vary sinusoidally on said plus d.c. bus and negative going bursts of varying width pulses whose duty cycles vary sinusoidally on said minus d.c. bus;

a first synchronous switch and a second oppositely phased synchronous switch, each said switches having an input and an output with the outputs joined to a common junction;

said plus d.c. line and said plus d.c. bus connected to provide positive going composite waveforms on the input of said first synchronous switch for passing positive going composite waveforms to said common junction during the positive halves of the input sinewaves;

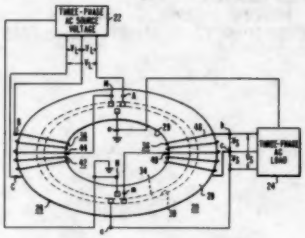
said minus d.c. line and said minus d.c. bus connected to provide negative going composite waveforms on the input of said second oppositely phased synchronous switch for passing negative going composite waveforms to said common junction during the negative halves of the input sinewaves; and

a low pass filter for filtering out the high frequencies of said positive and negative going composite waveforms on said common junction to provide output sinewaves on said output terminal.

4,638,177
ROTATING FLUX TRANSFORMER

David S. Takach, Brentwood, Mo.; Rao L. Boggavarapu, Monroeville, Pa., and Ram R. P. Sinha, Watkinsville, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1985, Ser. No. 798,259
Int. Cl.[4] H01H 85/02
U.S. Cl. 307—83 4 Claims



1. A rotating flux transformer comprising:

a magnetic core defining a closed loop having an outer surface disposed about a longitudinal axis,

said magnetic core further defining an axially extending opening,

a toroidal primary winding disposed about the outer surface of said magnetic core, said toroidal primary winding having first and second ends and a center tap,

a poloidal primary winding disposed through the axially extending opening of said magnetic core, said poloidal primary winding having first and second ends and a tap N,

said toroidal and poloidal primary windings being T-connected, with the first end of said poloidal primary winding being connected to the center tap of said toroidal primary winding,

a three-phase source of alternating potential having a line-to-line voltage V_L and first, second and third output terminals respectively connected to the second end of said poloidal primary winding and to the first and second ends of said toroidal primary winding,

and at least one secondary winding disposed in inductive relation with a selected one of said primary windings,

said poloidal primary winding being constructed to have about 0.866 times the number of turns of the toroidal primary winding, and about 0.288 times the number of turns of the toroidal primary winding from the tap N to the center tap of the toroidal primary winding.

4,638,178
MODULAR POWER SYSTEM

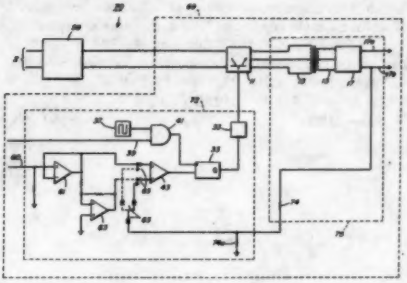
Dennis J. Kayser, Hudson, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Sep. 3, 1985, Ser. No. 771,872
Int. Cl.[4] H02J 1/00
U.S. Cl. 307—85 10 Claims

1. A modular switching power system for supplying power to a digital computer comprising:

input means for receiving and rectifying input alternating current (AC) power including a storage capacitor; and

at least one power module including a switching device coupled to the storage capacitor, feedback regulation means coupled to the switching device for control thereof, both being fixedly mounted on the power module, and a transformer and regulator means coupled to the switching means to produce a desired direct current (DC) output voltage, and voltage setting means for scaling the output voltage to a reference voltage used by the feedback means to regulate the particular voltage output, said transformer, regulator means and voltage setting means contained in a submodule removably mounted on the module,

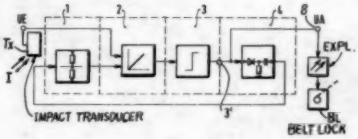


whereby a regulated DC voltage associated with the module is changed by replacing one submodule with another having a different DC voltage output.

4,638,179
EXTENDED RESPONSE TRIGGER CIRCUIT

Bernhard Mattes, Sachsenheim; Klaus Oswald, Denkendorf, and Wadym Suchowerskyj, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,471
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 84103592
Int. Cl.[4] B60R 21/08
U.S. Cl. 307—10 SB 8 Claims



1. Extended response trigger circuit, particularly for a passenger restraint system in a motor vehicle, having

means (Tx) for providing a trigger signal (UE);

a reference forming circuit (1) providing a reference level signal;

an integrator (2) receiving the trigger and reference level signals and providing an integrated trigger output signal;

a threshold circuit (3) connected to an responsive to the integrated trigger output signal from the integrator (2); and

an output circuit (EXPL) coupled to and responsive to output (3') of the threshold circuit (3) and requiring a signal of a predetermined minimum duration,

and comprising, in accordance with the invention,

feedback means (4, 44) coupled to said output (3') of the threshold circuit (3) and to an input of said reference forming circuit (1), for extending the duration of the response of the threshold circuit (3) by modifying the reference level signal applied to said integrator (2).

4,638,180

FREQUENCY DIVIDER CIRCUITS

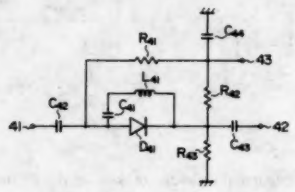
Morikazu Sagawa, Hachioji; Yoshikazu Mori; Motoi Ohba, both of Kawasaki; Mitsuo Makimoto, Yokohama, and Sadahiko Yamashita, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 7, 1985, Ser. No. 709,288

Claims priority, application Japan, Mar. 9, 1984, 59-45802; Mar. 9, 1984, 59-45803; Jul. 27, 1984, 59-157827

Int. Cl.⁴ H03B *19/00*

U.S. Cl. 307—219.1 **15 Claims**



1. A frequency divider circuit comprising:

a diode component supplied with an input signal from the anode side;

the capacitance of said diode component varying in accordance with the voltage applied thereacross;

an LC series circuit having a capacitor and an inductor connected in parallel with said diode component; and

means for forward biasing said diode component, whereby a frequency-divided output signal is obtained from said diode component.

4,638,181

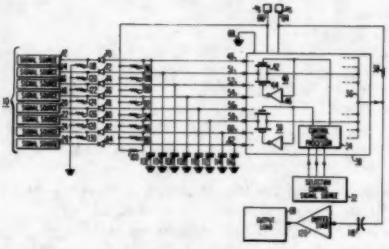
SIGNAL SOURCE SELECTOR

Michael S. Deiss, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1984, Ser. No. 676,105

Int. Cl.⁴ H03K *17/00, 17/56*

U.S. Cl. 307—243 **20 Claims**



5. A signal source selector comprising:

a plurality of signal input terminals for receiving respective signals to be selected;

an output terminal for providing a selected signal;

a source of a selection signal;

a first plurality of selectively operable switch means, said switch means having respective first and second terminals and being individually responsive to said selection signal for coupling a signal therebetween, said respective first terminals being coupled to said output terminal;

a source of a bias signal coupled to said output terminal for applying said bias signal thereto; and

a second plurality of controllable switch means, said switch means of said second plurality being coupled between respective ones of said signal input terminals and respective ones of said second terminals of said switch means of said first plurality, for coupling a signal therebetween in response to said bias signal being coupled by said selectively operable switch means of said first plurality.

4,638,182

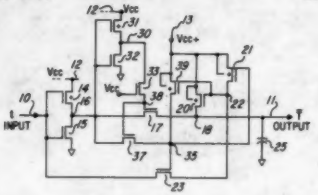
HIGH-LEVEL CMOS DRIVER CIRCUIT

Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 11, 1984, Ser. No. 630,470

Int. Cl.⁴ H03K *17/10, 17/687, 19/094, 3/027*

U.S. Cl. 307—270 **26 Claims**



1. A driver circuit, comprising:

an input node having a first logic state and a second logic state, said first and second logic states represented by different voltages,

an output node having capacitance to be charged when said input node goes from said first logic state to said second logic state,

charging means, connected to a first voltage supply and having an output, responsive to said input node so that said charging means connects said first voltage supply to said output of said charging means in response to said input node going from said first logic state to said second logic state,

a series transistor having a source-to-drain path connected between said output of said charging means and said output node, and having a gate coupled to said first voltage supply so that said source-to-drain path of said series transistor connects said output of said charging means to said output node, thereby causing said capacitance to be charged by said first voltage supply in response to said input node going from said first logic state to said second logic state, and

means, coupled to said input node, for connecting a second voltage supply of magnitude greater than said first voltage supply to said output node in response to said input node going from said first logic state to said second logic state.

4,638,183

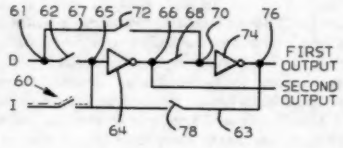
DYNAMICALLY SELECTABLE POLARITY LATCH

Dale A. Rickard, and Glen H. Rudelis, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,257

Int. Cl.⁴ H03K *3/356*

U.S. Cl. 307—291 **15 Claims**



1. A selective true or complement storage latch, comprising:

a data input switch having a first input node which can

assume either a zero or a one value, connecting to a binary bit input source, a control input for accepting a first or second control state signals, a first data output node which is selectively connected to said data input node when said control input is in said first state and a second data output node which is selectively connected to said data input node when said control input is in said second state;

a first inverting gate having an input connected to said first data output of said data input switch and an output connected to a first storage node;

a second inverting gate having an input coupled to said first storage node and an output coupled to a second storage node, said input of said second inverting gate being connected to said second output of said data input switch, said output of said second inverting gate being coupled to said input of said first inverting gate;

said data input node being selectively connected to said input of said first inverting gate through said first output of said data input switch when said control input is in a first state and said data input node being selectively connected to said input of said second inverting gate through said second output of said data input switch when said control input is in said second state;

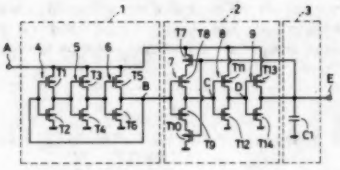
whereby the true value of the data at said data input node is stored in said latch when said control input is in said first state and the complement of the data at said data input node is stored in said latch when said control input is in said second state.

4,638,184

CMOS BIAS VOLTAGE GENERATING CIRCUIT

Kikuo Kimura, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,408
Claims priority, application Japan, Sep. 22, 1983, 58-174109
Int. Cl.⁴ G05F *1/56*
U.S. Cl. 307—297 **6 Claims**



1. A CMOS bias voltage generating circuit for use in a semiconductor integrated circuit device and for reducing an external DC power supply voltage to a lower DC bias voltage, comprising:

oscillating means coupled to said external DC power supply for converting said external voltage into a first clock pulse signal;

smoothing circuit means for converting a second clock pulse signal into said lower DC bias voltage;

CMOS inverter means for inverting said first clock pulse signal from said oscillating means;

CMOS buffer means for varying the pulse duration of the output signal from said CMOS inverter means to output said second clock pulse signal to said smoothing circuit means; and

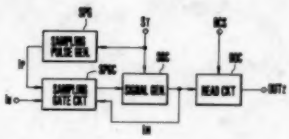
voltage compensating means for varying the transconductance of said CMOS inverter means in response to a variation of said lower DC bias voltage to regulate the pulse duration of said first clock pulse signal to thereby regulate said lower DC bias voltage to a predetermined amplitude.

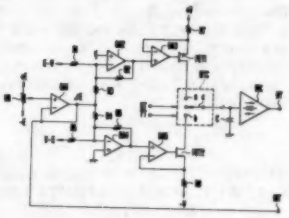
4,638,185

ANALOG SIGNAL MEASURING APPARATUS

Kensuke Kobayashi, Tokyo, and Yasuo Tazoh, Kanagawa, both of Japan, assignors to Iwatsu Electric Co., Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,622
Claims priority, application Japan, Nov. 15, 1983, 58-213289
Int. Cl.⁴ H03K *17/00, 17/92*
U.S. Cl. 307—352 **3 Claims**





1. An analog signal measuring apparatus for measuring an analog signal inputted thereto comprising:

a sampling pulse generating means responsive to a trigger signal supplied thereto to generate a sampling pulse signal;

a sampling gate means having, means for obtaining a sum signal representing the sum of an analog signal to be measured, a feedback signal and said sampling pulse signal and means for comparing a level of said sum signal with a predetermined threshold level to output a compared signal which has a high or low level;

an integrating means supplied with said compared signal and said trigger signal, for producing said feedback signal which is fed back to said sampling gate means, said integrating means being controlled in accordance with a control signal so that, upon reception of said trigger signal, said feedback signal is increased or decreased so as to invert said compared signal, thereby said feedback signal converging to a value;

a control means for providing said control signal to said integrating means; and

a reading means for reading out the converged value of said feedback signal outputted from said integrating means.

4,638,186

BIMOS LOGIC GATE

Kevin L. McLaughlin, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 2, 1985, Ser. No. 803,691
Int. Cl.⁴ H03K *19/01*
U.S. Cl. 307—446 **6 Claims**

1. A circuit comprising:

a first supply voltage terminal;

a second supply voltage terminal;

an input terminal;

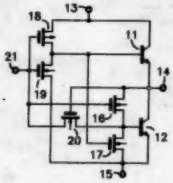
an output terminal;

a first bipolar transistor having its collector-emitter current path coupled between said first supply voltage terminal and said output terminal;

a second bipolar trnsistor having its collector-emitter cur-

rent path coupled between said output terminal and said second supply voltage terminal;

first means coupled between said first and second supply voltage terminals and coupled to said input terminal and a base of said first transistor for providing a voltage for biasing said first transistor, said first means providing a high impedance to said input terminal;



second means coupled between said output terminal and a base of said second bipolar transistor and coupled to said input terminal for biasing said second transistor; and

third means coupled between said input terminal and said base of said second bipolar transistor and coupled to said output terminal for further biasing said second bipolar transistor.

4,638,187

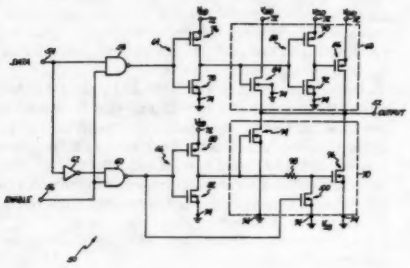
CMOS OUTPUT BUFFER PROVIDING HIGH DRIVE CURRENT WITH MINIMUM OUTPUT SIGNAL DISTORTION

Clifford H. Boler, Bloomington; William W. Leake, St. Paul; Surinder S. Rai, Plymouth, and Gene B. Zemske, Minneapolis, all of Minn., assignors to VTC Incorporated, Eagan, Minn.

Filed Oct. 1, 1985, Ser. No. 782,639

Int. Cl.[4] H03K *21/10*

U.S. Cl. 307—451 **32 Claims**



1. An output buffer for producing an output at an output terminal comprising:

a pull-up circuit responsive to a first signal for pulling the output toward a first supply potential when turned on, the pull-up circuit including first and second FETs, each having a gate, a source and a drain, the first and second FETs each having a current path formed by their source and drain connected in parallel between the output terminal and a first supply potential terminal, and first delay means connected to the gate of the second FET for delaying turn-on of the second FET with respect to turn-on of the first FET; and

a pull-down circuit responsive to a second signal for pulling the output at the output terminal toward a second supply potential when turned on, the pull-down circuit including third and fourth FETs each having a gate, a source and a drain, the third and fourth FETs each having a current path formed by their source and drain connected in parallel between the output terminal and a second supply potential terminal, and a second delay means connected to the gate of the fourth FET for delaying turn-on of the fourth FET with respect to turn-on of the third FET.

4,638,188

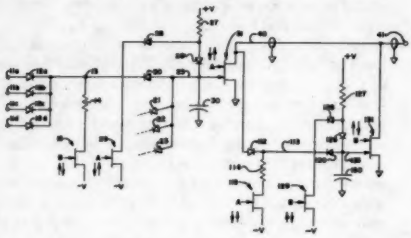
PHASE MODULATED PULSE LOGIC FOR GALLIUM ARSENIDE

Seymour R. Cray, Chippewa Falls, Wis., assignor to Cray Research, Inc., Minneapolis, Minn.

Filed Aug. 27, 1984, Ser. No. 644,249

Int. Cl.[4] H03K *17/04*

U.S. Cl. 307—453 **17 Claims**



1. In a gallium arsenide integrated circuit, a plurality of logic gates for use in constructing digital logic networks, each comprising:

a plurality of logic signal inputs, a clock signal input for receiving clock signals having first and second intervals, and a logic signal output;

a capacitance element;

means responsive to said logic signal inputs and to said clock signal input and operative in a first interval of a clock period for charging or discharging said capacitance element depending on the logical state of applied logic signals; and

means responsive to said clock signal input and operative in a second interval of a clock period for transmitting a logic signal to said output having a logical state corresponding to the charged condition developed on said capacitance element.

4,638,189

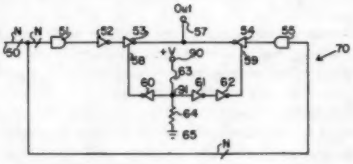
FAST AND GATE WITH PROGRAMMABLE OUTPUT POLARITY

George Geannopoulos; Cyrus Tsui; Mark Fitzpatrick, all of San Jose, and Andy Chan, Milpitas, all of Calif., assignors to Monolithic Memories, Incorporated, Santa Clara, Calif.

Filed Jun. 29, 1984, Ser. No. 626,377

Int. Cl.[4] H03K *19/20, 19/082, 19/003; G06F 11/28*

U.S. Cl. 307—465 **16 Claims**



1. A programmable polarity circuit having a first input terminal, a second input terminal, an output terminal, a first programming input terminal and a second programming input terminal comprising:

a first inverter having an output lead, and having an input lead connected to said first input terminal;

a second inverter having an input lead connected to said output lead of said first inverter, an output lead connected to said output terminal, and an enable input lead connected to said first programming input terminal wherein, when the programming input signal applied to said enable input lead of said second inverter is a first binary state said second inverter is enabled, and when the input signal applied to said enable input lead of said second inverter is a second binary state opposite said first binary state, said second inverter is disabled; and

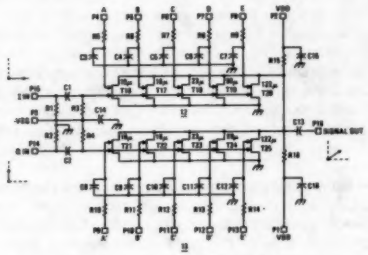
a third inverter having an input lead connected to said second input terminal, an output lead connected to said output terminal, and an enable input lead connected to said second programming input terminal wherein, when the input signal applied to said enable input lead of said third inverter is said first logical state said third inverter is enabled, and when the input signal applied to said enable input lead of said third inverter is said second logical state said third inverter is disabled.

4,638,190

DIGITALLY CONTROLLED WIDEBAND PHASE SHIFTER

Ying C. Hwang, Liverpool; Young K. Chen, Syracuse, and Louis J. Ragonese, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed May 20, 1985, Ser. No. 735,990
Int. Cl.[4] G01R *25/04*
U.S. Cl. 307—512 **31 Claims**



1. A digitally controlled wideband phase shifter, which is adjustable in selected discrete angular steps, comprising

A. an input terminal for application of an AC input signal;

B. phase splitting means coupled to said input terminal for resolving said input signal into a first and a second vector component in mutual quadrature, and including a first and a second output terminal for supplying said first and second components respectively;

C. a first and a second dual gate MESFET, each MESFET having a source terminal, a drain terminal, a signal gate terminal and n-fold control terminals, and being subdivided into an n-fold plurality of selectively activated MESFET segments,

each segment having a predetermined width to achieve a desired transconductance, and including

(1) an electroded source region connected to said MESFET source terminal

(2) an electroded drain region connected to said MESFET drain terminal, and

(3) a gate region defined between said source and drain regions having

(i) a signal gate electrode disposed between said source and an activating gate electrode, electrically connected to said MESFET signal gate terminal for modifying the AC output signal current of said MESFET as a function of the segment transconductance, and

(ii) an activating gate electrode disposed between said signal gate electrode and said drain for turning current flow "ON" or "OFF" in said MESFET segment and electrically connected to one of said control terminals,

said first and second of said quadrature related vector components being applied to the signal gate terminals of said first and second MESFETS respectively,

said segments of said first MESFET being proportioned and ordered for connection to an electrical control signal coupled to the n-fold control terminals of said first MESFET such that successive combinations of active segments provide successive transfer values proportional to successive values of the sine function of an angle theta

said segments of said second MESFET being proportioned and ordered for connection to an electrical control signal coupled to the n-fold control terminals of said second MESFET such that successive combinations of activated segments provide successive transfer values proportional to successive values of the cosine function of said angle theta; and

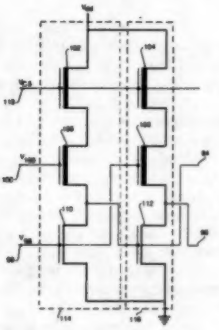
D. means for combining the quadrature related vector components at the outputs of said first and second MESFETS respectively proportioned to said sine and cosine values of said angle theta to form an output signal the phase of whose vector resultant represents a stepped rotation by said angle theta of the vector resultant of the input signal.

4,638,191

AMPLITUDE INSENSITIVE DELAY LINE

Richard A. Baumgartner, Palo Alto; John N. Dukes, Los Altos Hills, both of Calif., and George A. Fisher, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 5, 1984, Ser. No. 628,069
Int. Cl.[4] H03K *17/284, 17/693*
U.S. Cl. 307—602 **13 Claims**



1. A circuit for delaying a signal comprising a plurality of cascaded saturating circuit elements wherein each element in the plurality of cascaded saturating circuit elements comprises:

control means for varying delay through the element, the control means having a first node coupled to a voltage source, a second node and a third node wherein a signal may be placed on the third node in order to vary delay through the element;

a first depletion-type MOSFET including a drain node coupled to the second node of the control means, a gate node coupled to a prior element and a source node coupled to a subsequent element;

a first enhancement-type MOSFET including a drain node coupled to the source node of the first depletion-type

MOSFET, a source node coupled to ground, and a gate node coupled to the prior element and to a gate note of a depletion-type MOSFET in the subsequent element.

4,638,192

LINEAR DC MOTOR

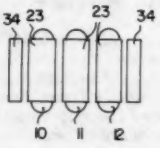
Johann von der Heide, Schramberg, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,681

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3149214

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—12 **10 Claims**



1. A direct current linear motor, particularly for use in data processing drive systems, said motor comprising:

a permanent magnetic system formed of a plurality of permanent magnet poles disposed linearly adjacent each other;

a ferromagnetic structure formed of at least one slotted flux-carrying member and a multi-strand winding formed into a plurality of coils, the coils disposed linearly adjacent each other on the flux-carrying member, the coils being energized in cyclic sequence and each said coil wound without overlap around a pole of the at least one flux-carrying member between adjacent slots thereof forming a multi-phase d.c. structure, each pole terminating in a shoe at one of its ends;

a flat air gap defined between and separating said permanent magnetic system and the pole shoes of said ferromagnetic structure,

said permanent magnetic system and said ferromagnetic structure being linearly movable relative to each other in their longitudinal direction, the axis of each said coil of said ferromagnetic structure extending perpendicular to the direction of movement; and

an auxiliary ferromagnetic pole at each end of said ferromagnetic structure with respect to the direction of movement thereof to substantially reduce or eliminate reluctance forces tending to impede relative movement between said permanent magnetic system and said ferromagnetic structure, said auxiliary ferromagnetic pole being formed by an additional pole separate from the winding poles at each end of said ferromagnetic structure, the auxiliary poles being formed from outwardly extending bent ends of a U-shaped ferromagnetic part that provides said additional poles, and the upward bend height of the auxiliary poles being 0.1–0.5 times and preferably about 0.2 times the intercoil pitch of the ferromagnetic structure.

4,638,193

LINEAR IMPULSE MOTOR

J. Paul Jones, Glenmoore, Pa., assignor to Med-Tech Associates, Broomall, Pa.

Filed Nov. 23, 1984, Ser. No. 674,185

Int. Cl.⁴ H02K *33/00*

U.S. Cl. 310—15 **1 Claim**

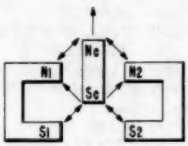
1. The method of creating a linear impulse motor comprising the steps of:

providing a first C-shaped core and providing first coil means on the first core, the ends of the first core to periodically constitute respectively north and south poles when the first coil means is periodically energized to periodically establish a first magnetic field the flux path of which extends through the core and between said ends;

providing a second C-shaped core identical to the first core and providing second coil means on the second core the ends of the second core to periodically constitute respectively north and south poles when the second coil means is periodically energized simultaneously with said first coil means to establish a second magnetic field the flux path of which extends through the second core and between the ends thereof;

arranging the first and second cores so that when said magnetic fields are established said north poles of each are spaced apart and face one another and said south poles of each are spaced apart and face one another to provide a concentrated flux path extending between said opposing north and south poles;

providing an elongated permanent magnet the length of which is less than the outside length between said north and south poles but greater than one-half of said outside length and also providing for the permanent magnet to be



movable back and forth along said concentrated flux path between a first position and a second position;

establishing said first position so that when the permanent magnet is in the first position the mid-section thereof is between said north poles of the first and second cores and the north pole of the permanent magnet is spaced outboard of said north poles of the first and second cores and the south pole of the permanent magnet is midway between said north and south poles of the first and second cores;

establishing said second position so that when the permanent magnet is in the second position the south pole thereof is between said north poles of the first and second cores and the north pole of the permanent magnet is spaced outboard of said north poles of the first and second cores a distance greater than first said spacing thereof; and

periodically energizing said coils to cause the permanent magnet to move from said first to said second position and respectively after each said energizing deenergizing said coils to permit the permanent magnet to move from the second position to the first position by its own permanent magnetic force.

4,638,194

COHERENT MAGNETO-CALORIC EFFECT SUPERCONDUCTIVE HEAT ENGINE PROCESS CYCLE

Peter D. Keefe, Box 259, Roseville, Mich. 48066

Filed Jul. 18, 1983, Ser. No. 515,062

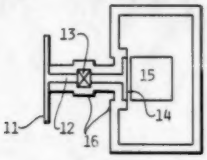
Int. Cl.⁴ H02K *9/00*

U.S. Cl. 310—40 R **52 Claims**

1. A method for producing work from a superconductive heat engine having field control means for applying a magnetic field and heat reservoir means for supplying fuel for said heat engine, comprising the steps of:

providing at least one thermally and electrically substantially isolated segment made from a superconductive material having $100\xi(T)$ greater than $\sqrt{5}\lambda(T)$ and having a size between $100\xi(T)$ and $\sqrt{5}\lambda(T)$, which will achieve a magneto-caloric effect phase transition affecting substantially the entire volume of said segment in which a mixture

of phase state is substantially absent during said phase transition, where $\xi(T)$ is defined as the temperature dependent range of coherence of the superconductive electrons and $\lambda(T)$ is defined as the temperature dependent depth of penetration into the superconductor by a magnetic field, and where a magneto-caloric effect is defined as a superconductive phase variation process in which latent heat evolution is capable of varying the temperature of the superconductor;



cycling said segment between a superconductive phase and a normal phase by varying the applied magnetic field relative to said segment in a predetermined relationship with a change in the temperature of said segment and selectively supplying heat from said heat reservoir means in cooperation with a magneto-caloric effect, said work being produced by the relative change in the applied magnetic field during said superconductive phase.

4,638,195

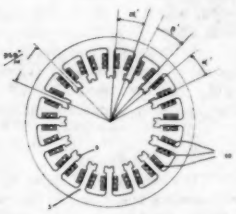
MULTIPLE-POLE STEPPING MOTOR

Ted T. Lin, 20850 Stevens Creek Blvd., Cupertino, Calif. 95014

Filed Feb. 11, 1985, Ser. No. 700,039

Int. Cl.[4] H02K *37/00*

U.S. Cl. 310—49 R **8 Claims**



1. A multiple pole stepping motor comprising,

an annular stator having an even number of stator poles around an inner circumference where adjacent stator poles are grouped in pairs, where each stator poles has a plurality of pole teeth, and wherein the angle α between the closest, adjacent teeth between said first stator pole and said second stator pole of each group is governed by the relationship:

$$\alpha = 2t(2n+1)$$

where n is any integer greater than zero, and t is the step angle,

a stator winding which winds around a first stator pole of each pair of stator poles in a first direction, and which winds around a second stator pole of each pair of stator poles in a second direction, such that the said first stator pole and said second stator pole may develop a magnetic flux having the same phase but opposite polarity when said stator winding is energized, and

a rotor disposed within said annular stator, said rotor including magnetic means polarized in an axial direction between two ends thereof for carrying magnetic flux, a first pole cap having a number of rotor teeth being attached to a first end of said magnetic means, and a second pole cap having a number of rotor teeth being attached to a second end of said magnetic means, the rotor teeth of said first and second pole caps being juxtapositioned proximate to said teeth of said stator poles, where the rotor teeth of said first pole cap and the rotor teeth of said second pole cap are angularly offset.

4,638,196

HAND-HELD TOOL WITH AN ELECTRIC MOTOR AND WEARING SHELLS FOR SUPPORTING THE SAME

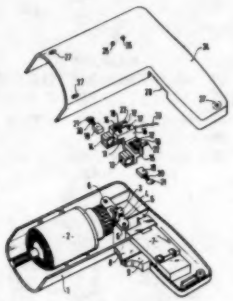
Ernst Krämzler, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,264

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413233

Int. Cl.[4] H02K *5/04, 7/14, 11/00*

U.S. Cl. 310—50 **6 Claims**



1. A hand-held machine tool including a housing having housing shells connectable to each other, an electric motor, and a split motor bearing accommodated in said housing and including a lower shell half and an upper shell half connectable to an disconnectable from said lower shell half, both shell halves supporting in assembly a brush-side end of a motor shaft; and electric structural components, said lower shell half being secured in said housing and remaining therein whereas said upper shell half is simultaneously a carrier for supporting said electric structural components and forms with said electric structural components a pre-assembled integral component assembly removable from and insertable into said housing.

4,638,197

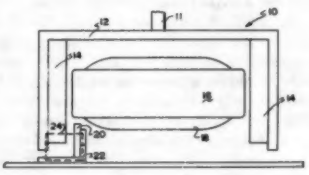
MAGNETIC FLUX SHIELD AND ENHANCER FOR BRUSHLESS MOTORS

Memorial Kalagidis, North Canton, Ohio, assignor to Ametek, Inc., Kent, Ohio

Filed Sep. 27, 1985, Ser. No. 781,409

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—67 R **11 Claims**



1. A motor, comprising:

a rotor having a plurality of magnetic elements uniformly positioned about a first surface thereof;

a plurality of magnetic sensing devices in fixed spaced relationship from said first surface; and

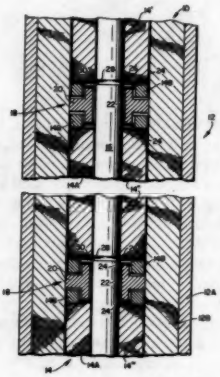
a magnetic flux conducting element extending from each said magnetic sensing device to a point in juxtaposition to said rotor, said magnetic flux conducting element having first and second orthogonal legs, said first leg having a center portion in alignment with said magnetic sensing device and side portions extending on each side of said center portion, and beyond said magnetic sensing device, said center portion being of less magnetic reluctance than each of said side portions.

4,638,198

ELECTRIC SUBMERGIBLE MOTOR WITH BEARING ASSEMBLY ISOLATED FROM AXIAL LOADS

Susan Cochran, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 22, 1985, Ser. No. 693,200
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—871 **7 Claims**



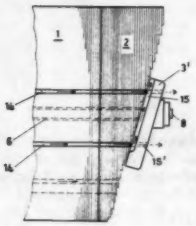
1. In a submergible electric motor having an elongated cylindrical stator containing an elongated cylindrical rotor, said rotor including a shaft extending axially of the motor and at least a pair of axially spaced upper and lower rotor sections coupled to the shaft for rotation therewith, but capable of limited axial movement relative thereto, and a bearing assembly disposed between said rotor sections and including a fixed bearing ring and a coaxial bearing sleeve therein rotatable with the shaft, said shaft extending continuously through said bearing assembly for the transmission of axial loads along said shaft without transferring said loads to said bearing assembly, the improvement comprising means on said shaft separate from said bearing sleeve for supporting the lower end of the upper rotor section, for receiving axial loads therefrom, and for preventing the exertion of such loads upon said bearing assembly, the lower end of the upper rotor section being close enough to said bearing assembly to exert axial loads on said bearing assembly during the operation of said motor in the absence of said supporting means.

4,638,199

STATOR BODY WITH LAMINATED COMPRESSION PLATES

Ernst Brem, Schlieren, and Josef Merki, Würenlingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 12, 1985, Ser. No. 754,213
Claims priority, application Switzerland, Aug. 9, 1984, 3824/84
Int. Cl.[4] H02K *5/00*
U.S. Cl. 310—91 **5 Claims**



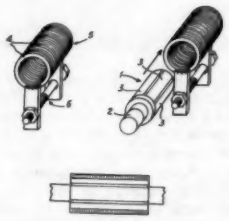
1. A stator comprising a stator body (1) which is axially compressed at one axial end by a compression plate (2) by means of a tension bolt (8) passing through said compression plate (2) and non-magnetic tie plates (3), in which arrangement said compression plate (2) comprises laminations (4) which are stacked together and bonded to each other, said compression plate (2) having a conical outside contour on the outside surface facing away from said stator body (1), said compression plate (2) having a stepped outside contour, said non magnetic tie plates (3) having on the surface facing said compression plate (2) a contour which essentially matches the stepping of said compression plate (2), said non-magnetic tie plates (3) comprising individual annular segments (3') and having on the surface facing said compression plate (2) radially-extending grooves (15) which communicate with axially extending holes (14) for cooling gas in said compression plate (2).

4,638,200

HIGH SPEED PERMANENT MAGNET ROTOR

Loic Le Corre, Colombes, and Albert L. Rolland, Paris, both of France, assignors to Precision Mecanique Labinal, Bois d'Arcy, France

PCT No. PCT/FR85/00121, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/05506, PCT Pub. Date Dec. 5, 1985
PCT Filed May 21, 1985, Ser. No. 822,405
Claims priority, application France, May 23, 1984, 8408015
Int. Cl.[4] H02K *15/02, 21/14*
U.S. Cl. 310—156 **11 Claims**



1. In rotors for rotating machines having peripheral magnets on the rotor adapted to rotate at very high speeds, in particular in machines whose magnets are fixed to the rotor, the improve-

ment characterized in that the peripheral magnets of the rotor are surrounded by a thin cylindrical hoop forming a sleeve and exerting a pre-stressing force on the subjacent magnets, said hoop being made from one or more thin bands wound around the rotor under conditions which produce a pre-stressing force having a magnitude such that when the rotor rotates at maximum speed, the geometric possibility of the magnets coming away from the surface of the rotor is prevented, said band being made from a non-magnetic, work-hardened, metallic material having a high elastic limit and a small thickness.

4,638,201

ELECTRONICALLY COMMUTATED DC MOTOR

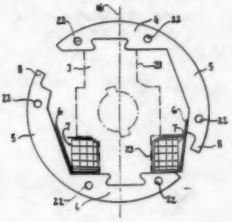
Josef Feigel, Landshut, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 610,160, May 14, 1984. This application Feb. 28, 1986, Ser. No. 834,674

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318463

Int. Cl.⁴ H02K *1/00*

U.S. Cl. 310—216 **16 Claims**



1. An electronically commutated direct current motor comprising, in combination:

a direct current motor including a rotor having a dome-shaped body comprised of magnetizable material having a permanent magnet disposed on an inner circumference of said dome-shaped body, said rotor being a bipolar external rotor;

a stator located within said permanent magnet and including a yoke stack and a plurality of pole stacks and further including a longitudinal stator axis providing a longitudinal axis of symmetry through said motor;

a plurality of coilforms carried by said yoke having a plurality of stator windings wound on said coilforms, said stator winding for providing an alternating current field, said stator having a double T-shaped design with said stator winding being disposed on a common leg of said double T-shaped stator, said pole stacks and said yoke stack with said stator windings wound thereon being disposed asymmetrical to said longitudinal stator axis;

a plurality of stator pole stack extensions projecting in the same circumferential direction and separated from said permanent magnet by a constant air gap, said air gap located between said stator and said rotor, said stator alternating current field having a polar axis staggered parallel to said longitudinal stator axis by a fixed distance and said rotor permanent magnet having a polar axis orthogonal to a rotor neutral zone and displaced from said stator alternating current polar axis by a non-zero angle epsilon when said stator winding is currentless;

a rotor shaft penetrating said dome-shaped body for turning an external load;

a printed circuit board mounted adjacent to said coilform and supported by a mounting flange within said dome-shaped body, said printed circuit board having an electronic circuit for providing commutation of an input signal; and

a plurality of lugs connected to said plurality of stator pole stack extensions, each of said pole stack extensions including one of said plurality of lugs for further projecting each of said pole stack extensions along a circumferential direction of said plurality of pole stacks for providing a single defined rest position for said rotor when said stator windings are currentless and wherein said plurality of lugs connected to said plurality of stator pole stack extensions provides a non-constant magnetic resistance to said rotor along the circumference of said stator creating said non-zero angle epsilon and said single defined rest position of said rotor when said stator winding is currentless for providing an optimal starting torque for said direct current motor.

4,638,202

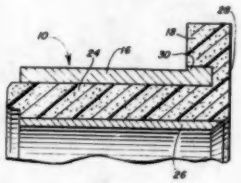
COMMUTATOR AND METHOD OF MAKING SAME

Howard A. Ebner, Glencoe, Ill., assignor to Resinoid Engineering Corporation, Skokie, Ill.

Filed Sep. 11, 1985, Ser. No. 774,710

Int. Cl.⁴ H02K *13/04*

U.S. Cl. 310—235 **9 Claims**



1. A commutator assembly, comprising:

a core of insulating material;

a plurality of commutator segments disposed around the core and combining to define an outside, generally cylindrical surface means; and

riser means molded to one end of the core and projecting radially outwardly beyond said surface means, the riser means including a plurality of locating means for receiving and positioning the coil ends of an appropriate motor armature in engagement with respective ones of the commutator segments.

4,638,203

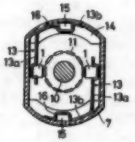
ATTACHMENT STRUCTURE FOR BRUSH HOLDER SPRINGS

Yohji Maki, and Norio Umezawa, both of Takefu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 21, 1985, Ser. No. 749,472

Int. Cl.⁴ H02K *5/14*

U.S. Cl. 310—239 **4 Claims**



1. An attachment structure for brush holder springs in a motor having frame and a shaft supporting a commutator, comprising:

(a) a motor bracket adapted to be mounted on the motor frame and having a pair of diametrically opposite projec-

tions on inner peripheral wall surfaces thereof, each of said projections having a transverse dovetail-shaped cross section including a radially inward end wider than a radially outward end thereof; and

(b) a pair of brush holder springs supporting on one end portion thereof brushes, respectively, for sliding contact with the commutator and having on an opposite end portion thereof a gripping member fitting complementarily over said projections, respectively, under resilient forces, each of said gripping members having a dovetail-shaped configuration complementary to one of said projections.

4,638,204

HAMMER BRUSH HOLDER ASSEMBLY FOR A COMMUTATOR MOTOR

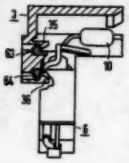
Albert Kirchner, Schweinfurt; Juergen Schoen, Wuerzburg, and Ortwin Happ, Rossbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,909

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434390

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **12 Claims**



1. A hammer brush holder for a commutator motor having a brush rocker, fastened to a housing of the commutator motor, with axially extending mounting means integrally molded on said brush rocker at one axial end, and a brush support arm swivel-mounted in a fixed axial position onto another end of each respective mounting means, the improvement comprising:

a brush fastened to each brush support arm respectively, and located at an end of said brush support arm opposite said swivel mounting;

each mounting means defining a lug respectively; and

a mounting means molded in one piece on the axial ends of the brush rocker in the interior of the housing, said means being molded in one piece on the brush lug; and

each brush support arm having a sleeve-shaped end means for swivel-mounting on and encompassing said respective lug, integrally molded thereon, whereby the sleeve-shaped end means slides onto the lug up to an axially positioning groove connection with the brush rocker.

4,638,205

PIEZO-ELECTRIC TRANSDUCER

Hideo Fujita; Yuichi Saito, and Masatoshi Miura, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

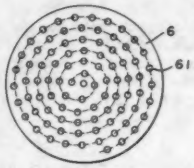
Filed Apr. 27, 1981, Ser. No. 257,652

Claims priority, application Japan, May 6, 1980, 55-6061[U]; Oct. 7, 1980, 55-142329[U]; Dec. 17, 1980, 55-180137[U]

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—312 **1 Claim**

1. In a first piezo-electric transducer comprising a piezo-electric ceramic sheet bonded to a vibrating reed and one or more electrodes bonded to said piezo-electric ceramic sheet, an improvement wherein said vibrating reed has a first plurality through-holes formed on a nodal line for vibration of said vibrating reed, wherein said vibrating reed has a second plurality of through-holes which are not formed on said nodal line and wherein each of said first and second plurality of through-holes are arranged in such a manner that a spiral form of holes



is formed from the center to the peripheral part of said vibrating reed.

4,638,206

SHEET-LIKE PIEZOELECTRIC ELEMENT

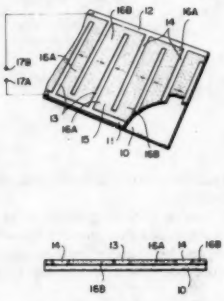
Tsutomu Tsunooka, Kariya; Tadashi Takeuchi, Nagoya; Kunihiro Ushida, Aichi, and Shogo Kawajiri, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 14, 1985, Ser. No. 744,618

Claims priority, application Japan, Jun. 14, 1984, 59-122435

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 B **7 Claims**



1. A sheet-like piezoelectric element comprising a pair of oppositely arranged terminals, comb-shaped electrodes projecting alternately from respective terminals of said pair of terminals and arranged in a zigzag shape formed with a slit in the lengthwise direction between the adjacent electrodes, and a piezoelectric layer made of composite piezoelectric material filling the slits in such a manner that the adjacent piezoelectric layer portions are polarized in opposite directions to each other, said piezoelectric layer having a thickness which is substantially the same of that of said electrodes.

4,638,207

PIEZOELECTRIC POLYMERIC FILM BALLOON SPEAKER

Peter F. Radice, Upper Merion, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 19, 1986, Ser. No. 841,137

Int. Cl.[4] H01L *41/08*

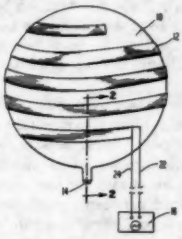
U.S. Cl. 310—328 **13 Claims**

1. Apparatus for retransmitting audio signals from an audio device remotely located from, and supplying said signals to, said apparatus which comprises

inflatable means having curved outer surfaces,

piezoelectric polymer film means conformably adhering to said outer surfaces of said inflatable means while inflated, said piezoelectric film having an electrode film coating disposed over each face thereof,

conductor means operably connected between output of said audio device and said electrode coatings for transmitting said audio signals to said film, said film converting electro-



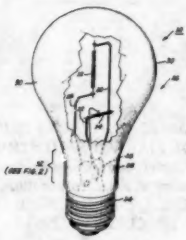
magnetic energy of said transmitted signals to retransmitted audio signals corresponding to said transmitted audio signals.

4,638,208

SANDBLASTED INCANDESCENT LAMPS WITH AN IMPROVED NECK SECTION

Lee W. Otto, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1985, Ser. No. 780,065
Int. Cl.[4] H01K *1/32*
U.S. Cl. 313—116 **7 Claims**



1. An incandescent lamp comprising:
at least a major filament mounted on an insulated stem;
an electrically conductive base affixed to said insulative stem and appropriately connected to at least said major filament;
an envelope having spatially disposed therein said mounted filament, said envelope having a neck section sealed to said electrically conductive base, said envelope having an electrostatically deposited light-diffusion coating substantially covering its inner surface, and an outer surface which is sandblasted except for the neck section of the outer envelope.

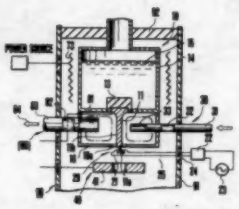
4,638,209

ION BEAM GENERATING APPARATUS

Tatsuo Asamaki, and Takao Kato, both of Tokyo, Japan, assignors to Anelva Corporation, Japan

Filed Sep. 4, 1984, Ser. No. 646,438
Claims priority, application Japan, Sep. 8, 1983, 58-165628
Int. Cl.[4] H05H *29/00*
U.S. Cl. 313—359.1 **21 Claims**

1. An ion beam generating apparatus comprising:
a vacuum chamber capable of being evacuated to a predetermined pressure;
an anode assembly disposed in said vacuum chamber, said anode assembly having an anode which has a needle like tip at one end thereof;
an extraction electrode disposed a predetermined distance from said needle-like tip;
gas supply means for supplying a predetermined gas to the vicinity of said anode assembly;
means for colling said anode assembly to a temperature



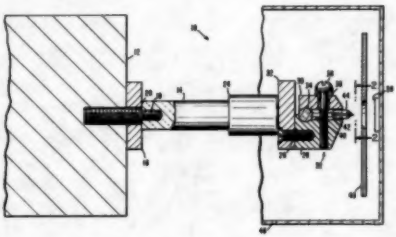
sufficient for said predetermined gas to condense on said anode;
means for heating said cooled anode assembly to maintain said anode assembly at a temperature between the melting point and the boiling point of said predetermined gas; and
power source means for providing an electric potential between said anode and said extraction electrode to ionize said predetermined gas condensed on said anode.

4,638,210

LIQUID METAL ION SOURCE

Jerg B. Jergenson, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 5, 1985, Ser. No. 720,470
Int. Cl.[4] H01J *1/00*
U.S. Cl. 313—362.1 **20 Claims**



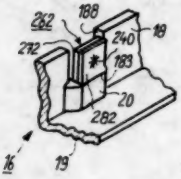
1. A body for serving as an ion source, said body comprising:
a billet of electrically conductive or semi-conductive material, said billet having a point end, a back end and sides, a slot in said billet extending from adjacent said point end to said back end and to said sides to separate said billet substantially to said point end into upper and lower portions; and
a rigid insulator in said slot to support said upper and lower portions with respect to each other; and
a point formed on said billet on said point end, said point being adjacent the end of said slot so that said billet has electrical continuity from said upper portion to said lower portion adjacent said point.

4,638,211

SHADOW MASK FOR A COLOR IMAGE TUBE AND IMAGE TUBE COMPRISING THE SAME

Carlo L. Fonda, Anagni, Italy, assignor to Videocolor, Montrouge, France

Filed Nov. 21, 1984, Ser. No. 673,824
Claims priority, application France, Nov. 25, 1983, 83 18853
Int. Cl.[4] H01J 29/07
U.S. Cl. 313—405 9 Claims



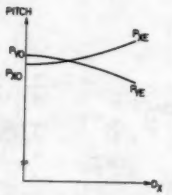
1. A color cathode ray tube comprising: a perforated mask for the selection of colors in order that an electron beam intended for a particular color only reaches, on the screen, the luminescent material of that color, the mask presenting an edge fixed to a frame through intermediate bimetallic strips, the frame being integral with the internal face of the glass wall of the tube adjacent to the screen, wherein the bimetallic strips between the edge of the mask and the frame are disposed along the length of the vertical sides, with a bimetallic strip located substantially at the center of each of these vertical sides and bimetallic strips located adjacent to the corners, the bending of the bimetallic strips adjacent to the corners being greater than the bending of the bimetallic strips at the substantially central position on the vertical sides.

4,638,212

COLOR CATHODE-RAY TUBE

Koji Nakamura, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,702
Claims priority, application Japan, Jun. 30, 1983, 58-120829
Int. Cl.[4] H01J 29/07, 29/10
U.S. Cl. 313—408 7 Claims



1. A color cathode-ray tube, comprising:

a set of three electron guns provided in an in-line array for emitting three electron beams;

a shadow mask with a curved surface disposed ahead of paths of said electron beams from said electron guns, in a direction intersecting with said paths, said shadow mask having a plurality of circular small apertures and the respective apertures transmitting sets of said electron beams;

a fluorescent screen with a curved surface disposed in parallel with said shadow mask, said fluorescent screen including sets of three fluorescent dots for three different colors at positions respectively associated with said three electron beams passing through each said aperture of said shadow mask; and

said shadow mask including, in its flat state before being formed to have a curved surface, an X axis and a Y axis passing through the center of said flat mask, the X axis being horizontal in parallel with the direction of said in-line array, the Y axis being vertical to the X axis, rows of said apertures in the X axis direction being curved more prominently in the shape of a barrel according to increase of the distance from the X axis and columns of said apertures in the Y axis direction being all straight lines parallel to the Y axis;

wherein P_{XO} is the distance from the column on the Y axis to the next adjacent column; P_{YO} is half the distance from the aperture on said center to the adjacent aperture on the Y axis; P_{XE} is the distance between adjacent columns located in a corner portion of said flat mask; and P_{YE} is half the associated distance between the adjacent apertures in a column located in said corner portion of said flat mask; P_{XO}, P_{XE} and P_{YE} being selected such that the following relations are satisfied:

$$P_{XO} \leqq P_{XE} \leqq 1.2P_{XO}$$

$$P_{YO}-25 \leqq PO_{YE} < P_{YO}\ (\mu m),$$

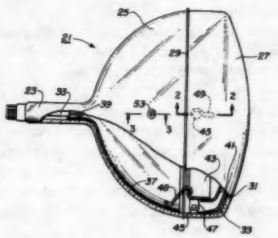
and wherein the distances P_{YE} and P_{YO} are selected such that a relation: $P_{YE}=P_{YO}(1-K_1N^2)$ is satisfied, where K_1 is a constant and N is a column number counted from said center (N=0 corresponding to the column on the Y axis).

4,638,213

CRT WITH INTERNAL CONTACT STRIPE OR PATCH AND METHOD OF MAKING SAID STRIPE OR PATCH

Samuel B. Deal, Lancaster, and Donald W. Bartch, Wrightsville, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 8, 1980, Ser. No. 195,183
Int. Cl.[4] H01J 31/00
U.S. Cl. 313—479 4 Claims



1. In a cathode-ray tube comprising an evacuated glass envelope including a glass funnel, a neck integral with said funnel, a glass faceplate panel sealed to said funnel, a luminescent layer on the interior surface of said faceplate, an electrically-conductive layer supported from the interior glass surface of said envelope, an electrically-conductive metal body attached to said interior envelope surface, and an electrically-conductive coating contacting said interior glass surface and both said electrically-conductive layer and said metal body, the improvement wherein said electrically-conductive coating consists essentially of a major proportion of metallic silver particles and a minor proportion of lithium silicate binder.

4,638,214

FLUORESCENT LAMP CONTAINING ALUMINATE PHOSPHOR

William W. Beers, Lyndhurst, and Thomas G. Parham, Gates Mills, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 715,858, Mar. 25, 1985. This application Apr. 21, 1986, Ser. No. 854,272

Int. Cl.[4] H01J *61/44*

U.S. Cl. 313—487 7 Claims

1. A fluorescent lamp having a sealed envelope enclosing means to generate a low-pressure mercury discharge within said envelope and a phosphor coating to convert at least a portion of the radiation emitted from said discharge to visible light, wherein said phosphor coating includes a phosphor comprising a plurality of fine-sized crystals having the general formula:

$$Ce_{1-x-y}La_xTb_yMg_zAl_{11}O_{19}$$

wherein

La is an optional constituent and x is in an amount up to about 0.50,

y is in the range from about 0.20 up to about 0.50, and

z is in the range from about 0.60 up to about 0.87,

said crystals having a median particle size of about 5.0 micron, and being further characterized by a ratio between its 544 nanometers wavelength peak emission to its 490 nanometers wavelength peak emission of at least 5.0 along with exhibiting trichromatic coordinate values in the range X=0.3190–0.3202 and Y=0.5377–0.5402.

4. A fluorescent lamp having a sealed envelope enclosing means to generate a low-pressure mercury discharge within said envelope and a phosphor coating to convert at least a portion of the radiation emitted from said discharge to visible light, wherein said phosphor coating comprises the combination of a blue color emission phosphor having an emission band in the wavelength range from about 430 nanometers wavelength up to about 490 nanometers, a red color emission phosphor having an emission band in the wavelength range from about 590 nanometers wavelength up to about 630 nanometers wavelength, and a green color emission phosphor having principal visible emission in the wavelength range from about 520 nanometers wavelength up to about 565 nanometers wavelength, said green color emission phosphor comprising a plurality of fine-sized crystals having the general formula:

$$Ce_{1-x-y}La_xTb_yMg_zAl_{11}O_{19}$$

wherein

La is an optional constituent and x is in an amount up to about 0.50,

y is in the range from about 0.20 up to about 0.50, and

z is in the range from about 0.60 up to about 0.87,

said crystals having a median particle size of about 5.0 microns diameter, and being further characterized by a ratio between its 544 nanometers wavelength peak emission to its 490 nanometers wavelength peak emission of at least 5.0 along with exhibiting trichromatic coordinate values in the range X=0.3190–0.3202 and Y=0.5377–0.5402, and with said phosphor combination containing about 34 up to about 48 parts by weight of said green color emission phosphor about 6 up to about 17 parts by weight of said blue color emission phosphor, and about 40 up to about 60 parts by weight of said red color emission phosphor to produce visible light of a white color.

4,638,215

CIRCUIT ASSEMBLY FOR TEMPERATURE-DEPENDENT CATHODE CURRENT TRACKING IN TRAVELING-WAVE TUBES

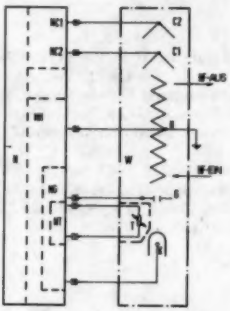
Eckart Schmid, Poing, and Ludwig Wanninger, Neubiberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,953

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311674

Int. Cl.[4] H01J *25/34*

U.S. Cl. 315—3.5 4 Claims



3. Travelling wave tube with control arrangement having a cathode and at least one cathode current-controlling electrode for maintaining the cathode current at a substantially constant value, comprising a temperature-dependent network thermally coupled to the tube for measuring the tube temperature; and an electronic control circuit, being part of the tube's power supply and being operatively responsive to said temperature, controllingly engaging said cathode current-controlling electrode for, by controlling the voltage at said electrode, maintaining the cathode current substantially at said constant value.

4,638,216

ELECTRON CYCLOTRON RESONANCE ION SOURCE

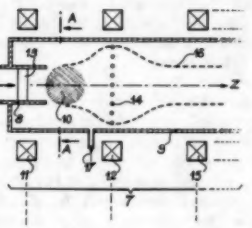
Marc Delaunay; René Gualandris; Richard Geller, all of Grenoble; Claude Jacquot, St Egreve; Paul Ludwig, Grenoble; Jean-Marc Mathonnet, Grenoble; Jean-Claude Rocco, Claix; Pierre Sermet, Grenoble; Francois Zadworny, Corenc, and Francois Bourg, St. Martin d'Héres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 18, 1984, Ser. No. 611,625

Claims priority, application France, May 20, 1983, 83 08401

Int. Cl.[4] H01J *7/24;* H05B *31/26*

U.S. Cl. 315—111.81 10 Claims



1. A multimode electron cyclotron resonance ion source comprising: a system for injecting an ultra-high frequency power into a container containing a gas or a vapor of a material for forming a plasma, said system having a tight window in a

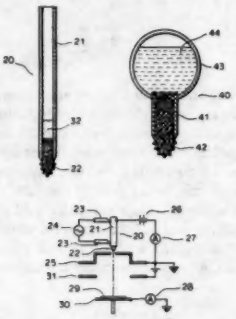
plane, a magnetic configuration in which said plasma is created and confined, and an ion extraction system, said magnetic configuration comprising: at least one group of coils supplying a magnetic field having a maximum value which is higher than that of the electron cyclotron resonance, in the plane defined by the tight window, and said magnetic field decreasing to a minimum value in front of the ion extraction system, while passing through the value of the magnetic induction B_r corresponding to the cyclotron resonance, the value of said magnetic field continually decreasing from said window to said ion extraction system.

4,638,217

FUSED METAL ION SOURCE WITH SINTERED METAL HEAD

Masao Okubo, Kanagawa; Kiyoshi Sugaya, Ibaragi; Toshinori Takagi, and Junzo Ishikawa, both of Kyoto, all of Japan, assignors to Nihon Denshizairyo Kabushiki Kaisha, Amagasaki, Japan

Filed Mar. 18, 1983, Ser. No. 476,470
Claims priority, application Japan, Mar. 20, 1982, 57-044884
Int. Cl.[4] H01J 7/24; H05B 31/26
U.S. Cl. 315—111.81 **6 Claims**



1. A field emission ion source comprising:
a container for a fusible material to be ionized, said container being formed of a material having a higher fusing point than said fusible material and having an opening therein; and
an ioning tip fixed in and protruding from said opening, said tip comprising a body formed of pulverulent metal having a degree of porosity to allow said fusible material to infiltrate therethrough in the molten state, wherein said porosity is determined by mixing pulverulent metal particles of different size.

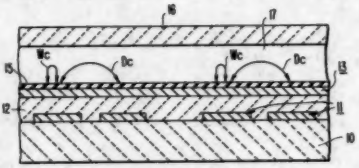
4. A field emission fused metal ion source comprising:
a container for a fusible metal to be ionized, said container being formed of a material having a higher fusing point than said fusible metal;
a pipe forming part of said container and including a body of molded sintered material fixed therein, said sintered material being wettable by said fusible metal in the molten state and comprising a mixture of sintered particles having a degree of porosity to said molten fusible metal to allow its infiltration therethrough said porosity being determined by mixing sintered material particles of different size;
said body being formed with an end of substantially conical shape forming an ionizing tip and being fixed in said pipe with said conical end protruding from an end of said pipe; and
heating means for melting said fusible metal whereby said molten fusible metal will wet said body of sintered material and infiltrate therethrough to said ionizing tip.

4,638,218

GAS DISCHARGE PANEL AND METHOD FOR DRIVING THE SAME

Tsutae Shinoda, Akashi, and Atsuo Niinuma, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 14, 1984, Ser. No. 640,579
Claims priority, application Japan, Aug. 24, 1983, 58-153545; Oct. 13, 1983, 58-192179; Dec. 6, 1983, 58-231169
Int. Cl.[4] G09G 3/10
U.S. Cl. 315—169.4 **26 Claims**



1. A surface discharge type gas discharge panel, comprising:
first and second substrates positioned to oppose each other and define a space for receiving a discharge gas therebetween;
a plurality of sustaining electrode pairs provided on the first substrate, each sustaining electrode pair comprising two substantially parallel electrodes;
a dielectric layer provided on the sustaining electrode pairs and the first substrate;
a plurality of address electrodes provided on the dielectric layer and arranged to intersect the sustaining electrode pairs;
a plurality of separator means corresponding to respective ones of the address electrodes, provided on the dielectric layer; and
surface insulating layer means having a thickness of 1 μm or less provided on the address electrodes, the separator electrodes and the dielectric layer, the surface insulating means comprising means for permitting a leakage current to flow from the surface of the surface insulating layer means to the address electrodes.

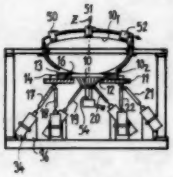
17. A method of driving a gas discharge panel including a first substrate, a plurality of pairs of sustaining electrodes positioned on the first substrate, a dielectric layer covering the sustaining electrodes, a plurality of address electrodes arranged to intersect the sustaining electrode pairs positioned on the dielectric layer, insulating layer means covering the address electrodes and the dielectric layer and having a surface on which charges accumulate comprising means for permitting a leakage current to flow from the surface of the insulating layer means to the address electrodes, and a second substrate opposing the first substrate in parallel relation to form a gas discharge space, comprising the steps of:
(a) applying a sustaining voltage to a first sustaining electrode of a pair of sustaining electrodes; and
(b) applying a write voltage having a polarity which is positive with respect to the sustaining voltage to an address electrode to generate a discharge at the intersection of the first sustaining electrode and the address electrode.

4,638,219

APPARATUS FOR ADJUSTING THE POSITION OF A DEFLECTOR ON A TELEVISION TUBE, PARTICULARLY A COLOR TUBE

Claude Pons, Rome, Italy, assignor to Videocolor, Montrouge, France

Filed Apr. 23, 1984, Ser. No. 603,047
Claims priority, application France, Apr. 26, 1983, 83 06834
Int. Cl.[4] H01J 29/70; H04N 5/655
U.S. Cl. 315—368 5 Claims



1. A deflection yoke adjustment apparatus for a cathode ray tube comprising:

a platform having a central opening therein for receiving a deflection yoke of a tube installed in a housing;

pairs of connection points located on the platform and defining a symmetrical closed geometric pattern, each corner thereof having a pair of connection points;

a plurality of arms connected at first ends thereof to corresponding connection points in oblique angular inclination to a rear surface of the platform to create a substantially symmetrical tapered space in back of the yoke;

actuating means secured to the housing and connected to second ends of respective arms for selectively adjusting the positions of the arms and, hence, the connected platform; and

an electrical connector connected to the tube and independent of mechanical contact with the platform;

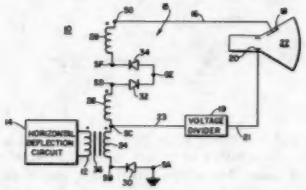
wherein the inclination of the arms and symmetrical closed pattern spatially distributes stress forces evenly in the arms as well as generating a large workable enlarging tapered space behind the tube for facilitating connection and removal of the connector from the tube.

4,638,220

HIGH VOLTAGE TRANSFORMER

Robert C. Beutel, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Mar. 4, 1985, Ser. No. 708,146
Int. Cl.[4] H01J 29/70
U.S. Cl. 315—411 6 Claims



1. A high voltage transformer comprising:

a primary winding; and

a secondary circuit coupled to said primary winding for developing a high voltage in response to the energizing of said primary winding, said secondary circuit including first, second and third windings and first and second rectifying means;

said first rectifying means being connected in a selected polarity between ground and a first end of said first winding;

the opposite end of said first winding being connected to a first end of said second winding;

said second rectifying means being connected in said selected polarity between the opposite end of said second winding and a first end of said third winding; and

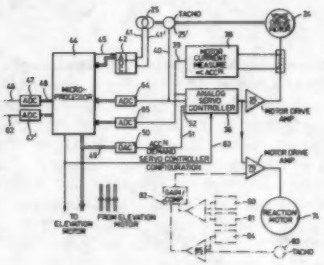
terminal means at the opposite end of said third winding at which said high voltage appears for supplying said high voltage to an external load.

4,638,221

REACTION FORCE COMPENSATOR

Nicolas L. Brignall, Edinburgh, Scotland, assignor to Ferranti plc, London, England

Filed Nov. 8, 1985, Ser. No. 796,117
Claims priority, application United Kingdom, Nov. 9, 1984, 8428412
Int. Cl.[4] H02P 1/54
U.S. Cl. 318—48 7 Claims



1. A structure supporting a body capable of undergoing acceleration about an axis of the structure including reaction force compensation means comprising a further axis through the structure extending in the same direction as the axis about which the body can accelerate, a reaction member, having a moment of inertia greater than the body, supported by the structure for rotation about said further axis, reaction drive means, responsive upon acceleration of the body to accelerate the reaction member independent of, and simultaneously with, the body in the opposite direction thereto and velocity step-down coupling means disposed between the reaction member and reaction drive means to rotate the reaction member at a lower acceleration rate than the body, said reaction drive means being arranged to produce a rate of change of angular momentum in the compensation means such that the torsional reaction forces of the body and compensation means on the structure are equal and opposite.

4,638,222

DC MOTOR DRIVING CIRCUIT FOR ELIMINATING SPURIOUS TRANSITION CONDITIONS

Manabu Sawaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,044
Claims priority, application Japan, Aug. 13, 1984, 59-168995
Int. Cl.[4] H02P 7/68
U.S. Cl. 318—111 4 Claims

1. A DC motor driving device comprising:

latch means for holding an input digital signal and outputting an output digital signal in response to a detection signal;

detecting means for producing said detection signal when corresponding bits of said input signal and said output signal of said latch means are not the same;

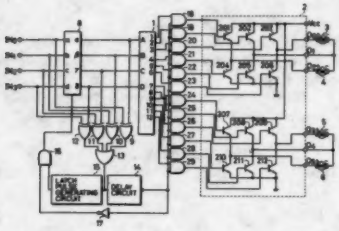
first and second switch elements series-connected to each

other through a series-connecting point also connected to a first terminal of a DC motor;

third and fourth switch elements series-connected to each other through a series-connecting point also connected to a second terminal of said DC motor;

means for supplying a voltage to a series circuit of said first and second switch elements and to a series circuit of said third and fourth switch elements;

decoder means, having output terminals connected to control inputs of respective ones of said first through fourth



switch elements, for subjecting an output a signal of said latch means to logical conversion and selectively turning on ones of said first through fourth switch elements according to signal produced on said output terminals of said decoder means as a result of said logical conversion; and

delaying and switching means responsive to said detecting means for delaying an output signal of said decoder to said first through fourth switch elements after a predetermined period of time and for turning off said first through fourth switch elements for said predetermined period of time following production of said detection signal.

4,638,223

MOTOR DRIVING CIRCUIT

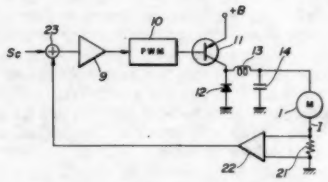
Shigeru Tajima, Kanagawa, and Toshiya Nakabayashi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,305

Claims priority, application Japan, Jun. 7, 1984, 59-116944

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—254 **2 Claims**



1. A driving circuit for a motor, comprising:

(a) means for generating a control signal which depends on rotation of the motor;

(b) a PWM circuit outputting pulses which depend on the control signal;

(c) means for generating a voltage which depends on the pulses from the PWM circuit;

(d) means for applying the voltage to the motor;

(e) means for sensing a current through the motor;

(f) means for controlling the PWM circuit on the basis of the sensed current and the control signal; and

(g) means for cutting off dc and low-frequency components of the sensed current.

4,638,224

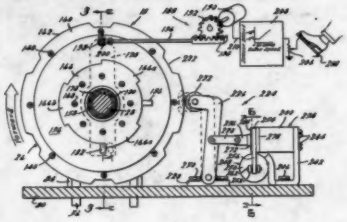
MECHANICALLY SHIFTED POSITION SENOR FOR SELF-SYNCHRONOUS MACHINES

David J. Gritter, Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 29, 1984, Ser. No. 645,227

Int. Cl.[4] H02K *29/08*

U.S. Cl. 318—254 **5 Claims**



1. A drivetrain for use with an electrically powered vehicle comprising:

an electric power source;

an electrical motor including a stator and a rotor;

flag means rotating in a timed relationship with said rotor;

sensor means mounted in a predetermined angular relationship with the stator for sensing the presence of the flag means as the rotor turns and for generating a signal representative of rotor position;

adjustment means for selectively altering the angular relationship between the sensor means and the stator as a function of motor speed to effect a desired load angle and back EMF; and

circuit means connected to said power source for selectively energizing said motor as a function of rotor position.

4,638,225

METHOD AND APPARATUS THEREFOR IN MOTOR SPEED CONTROL

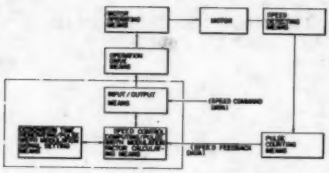
Shigeki Morinaga; Kunio Miyashita, both of Hitachi; Hiroshi Hayashida, Mito, and Tadashi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 597,747, Apr. 6, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,923

Claims priority, application Japan, Apr. 8, 1983, 58-60911

Int. Cl.[4] H02P *5/06*

U.S. Cl. 318—341 **6 Claims**



1. A pulse width control apparatus for controlling motor speed in which the number of pulses relating to motor speed feedback data is counted so as to control the speed of the motor in accordance with speed command data and a generated pulse width modulation signal of variable pulse width based on the counted number of pulses, comprising a free-running hardware timer for generating an interrupt request signal at variable times in dependence upon ON-time data and OFF-time data of the pulse width modulation signal set therein, a microcomputer being responsive to said interrupt request signal from said free running hardware timer for generating the pulse width modulation signal, said microcomputer including means forming a

soft-timer implemented in a program controlled by an instruction execution time of said microcomputer, ON-time data and OFF-time data of the pulse width modulation signal being selectively set in one and the other of said hardware timer and said soft-timer means in dependence on values of ON and OFF times, respectively, the ON and OFF states of the pulse width signal being changed when the contents of said hardware timer and soft-timer means reach predetermined values for controlling the pulse width of the generated pulse modulation signal, said microcomputer including means for correcting the ON-time data and OFF-time data set in selected ones of said hardware timer and said soft-timer means in accordance with ON and OFF processing times therefor, and means for determining whether the pulse width modulation signal is to be in the ON or the OFF state when the contents of said hardware timer and said soft-timer means reach the predetermined values.

4,638,226

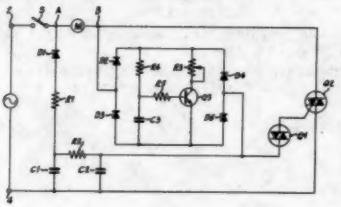
SPEED CONTROL SYSTEM WITH FEEDBACK AND SOFT-START

Michael A. Damiano, Germantown; Richard F. Schmerda, Oak Creek, and Lawrence G. Searing, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 7, 1985, Ser. No. 699,522

Int. Cl.[4] H02P *5/16*

U.S. Cl. 318—345 R **5 Claims**



1. An adjustable speed control system for a universal motor connected in a supply circuit for providing full-wave AC power to said motor comprising, in combination:

a bidirectional conducting thyristor having a pair of main electrodes connected in series circuit relation with said motor in said supply circuit and having a gate electrode; and

a double-time constant triggering circuit connected across said supply circuit in parallel circuit relation with said thyristor and connected to said gate electrode for controlling the conduction angle of said thyristor, said triggering circuit comprising;

a first time constant circuit comprising a first resistor and capacitor and a unidirectional diode connected in series across said supply circuit at one side of said motor for sensing counter emf in said motor and providing a feedback signal in said triggering circuit only on alternate half cycles of said full-wave AC power;

a second time constant circuit comprising an adjustable resistor and a second capacitor connected in series across said supply circuit at an opposite side of said motor for setting the speed of said motor;

a third resistor connecting the junction of said first resistor and capacitor to the junction of said adjustable resistor and second capacitor across said motor; and

means connecting said last mentioned junction to said gate electrode.

4,638,227

METHOD AND APPARATUS FOR RECOVERING NORMALITY IN MOVING SEQUENCE OF MACHINERY

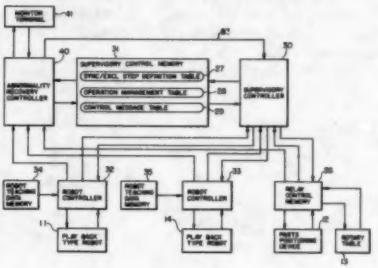
Masanori Katayama, Niihari; Norihisa Komoda, Kawasaki; Tomohiro Murata, Ebina, and Kazuo Kera, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,910

Claims priority, application Japan, Jan. 18, 1984, 59-5577; Feb. 1, 1984, 59-15188; Apr. 11, 1984, 59-70853

Int. Cl.[4] G05B *23/02, 19/00*

U.S. Cl. 318—565 **4 Claims**



1. A method of controlling machine tools in which a series of operations in a sequence is executed by a combination of synchronous control and exclusive control with respect to unit operations programmed in advance and in which said unit operations are subject to possible abnormality, wherein the method of recovering normality of the series of movements following abnormality, comprises a first storing of data indicating the relationship in the sequence of the execution of each unit operation to the execution of other unit operations to be controlled synchronously or exclusively, said data including information on a series of steps specifying the correspondence between at least one execute stand-by unit operation number and at least one completion stand-by unit operation number; a second storing of information relating to the operational status of each unit operation, said information including information on operation management indicating the execution management status and operation status of each unit operation; a third storing of operation instructions for executing each unit operation; and when machine tools have stopped due to the occurrence of an abnormality while a series of unit operations are being executed by the operational instruction stored by said third storing, appointing a unit operation for restarting on the basis of the relationship of the sequence of execution of the unit operations stored by said first storing and correcting information concerning the operational status stored by said second storing by following a reverse sequence to a normal status with reference to said data stored by said first storing.

4,638,228

DIGITALLY CONTROLLED ANALOG OPERATING CONTROL SYSTEM, AND METHOD

Erich Junginger, Stuttgart; Eberhard Schnaibel, Hemmingen, and Erich Schneider, Kirchheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,882

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430078; Jul. 25, 1985, 3526620

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—569 **5 Claims**

1. In combination with a fuel supply control element (9) of an internal combustion engine of a motor vehicle, a high-resolution control system, for controlling positioning of said element (9), having

means (12) for receiving digital control signals;

computer means (1) for processing the digital control signals

in accordance with a predetermined program, and providing digital command signals in n-bit parallel digital form;

a digital/analog converter (2) receiving the digital command signals and providing an analog command signal;

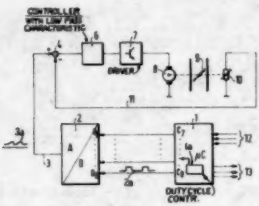
a positioning means (8) mechanically coupled to said control element (9) and controlling the position thereof;

an analog control loop including a position transducer (10) sensing the actual position of the positioned control element (9) and providing as actual position signal,

a controller (6) controlling the positioning means (8) and providing a position control signal, and

a comparator (4) connected to and comparing the actual position signal with the analog command signal derived from the digital/analog converter, and providing a deviation signal to the controller (6) for controlling the positioning means (8),

and comprising, in accordance with the invention,



means for providing a resolution of more than 2^n levels in said position control signal, including

means (1*a*) chopping at least the lowest-order bit (D_0) of said digital command signal at a predetermined modulation frequency into a sequence of pulses in which the duty cycle, or pulse-duration/pulse-gap ratio, is adjustable to correspond to a desired position control signal level and hence a desired position setting of said fuel supply control element (9), and

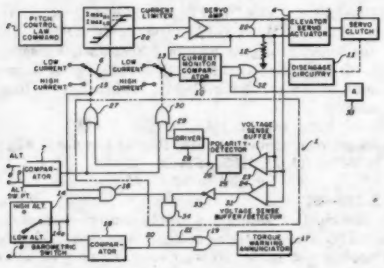
low-pass filter means (5; 6) filtering said predetermined modulation frequency from the output from the digital-/analog converter to derive an analog value representative of the pulse energy applied to the digital/analog converter at the lowest-order bit in accordance with the pulse-duration/pulse-gap ratio being transmitted thereto by the computer means (1).

4,638,229

ASYMMETRIC TORQUE SWITCHING FOR AIRCRAFT AUTOPILOT

Byron F. Birkedahl, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,752
Int. Cl.[4] B64C *13/18*
U.S. Cl. 318—584 **6 Claims**



1. Apparatus for providing asymmetrical torque switching at high altitude in an aircraft autopilot of the type having a first and second state current limiter for limiting maximum pitch maneuvers of said aircraft, a current monitor for disengaging said autopilot in case of malfunction and a torque warning annunciator for alerting aircraft crew of said aircraft if said autopilot malfunctions, said apparatus comprising:

a first sensing means for determining polarity of a signal representative of direction of pitch of said aircraft and for providing a first signal when said aircraft pitch is upward,

means coupled to said first sensing means for providing a first switching signal to said autopilot for switching said current limiter to a first state upon receipt of said first signal,

means coupled to said first sensing means for providing a second switching signal to said autopilot for switching said current monitor to said first state upon receipt of said first signal,

a second sensing means for determining polarity of said signal representative of direction of pitch of said aircraft and for providing a second signal when said aircraft pitch is upward,

means coupled to said second sensing means for providing a third switching signal to said autopilot for inhibiting output of said annunciator upon receipt of said second signal, and

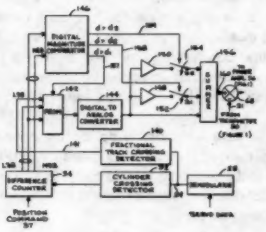
means to monitor G-loading of said aircraft for providing a signal to disengage said autopilot when said aircraft G-load exceeds a predetermined limit.

4,638,230

BANG-BANG CONTROLLED VELOCITY COMMAND GENERATOR

Patrick S. Lee, Campbell, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 418,508, Sep. 15, 1982. This application Nov. 8, 1985, Ser. No. 797,173
Int. Cl.[4] G05D *23/275*
U.S. Cl. 318—632 **9 Claims**



1. Apparatus for indicating a desired velocity for a moveable element according to a predefined distance velocity relationship responsive to an existing distance between a desired terminal position and a current position, comprising:

means for generating the existing distance between a desired terminal position and the current position;

comparing means for comparing the existing distance between the desired terminal position and the current position with at least one of a plurality of predefined distances

and generating at least one indication of the predefined distances which are exceeded by the existing distance;

first means for producing a single discrete velocity value and a second plurality of selected discrete velocity values when the existing distance exceeds a specified one of said predefined distances, each velocity value of said second values corresponding to a preselected distance which is less than the specified predefined distance and for combining said first and at least one of said second velocity values to generate a value corresponding to the existing distance between the desired terminal position and the current position;

second means for producing a plurality of signals each having a predefined level in response to the indication generated by said comparing means; and

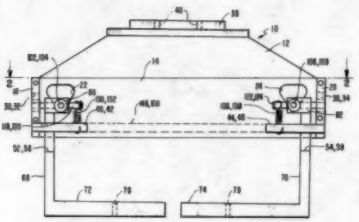
summing means responsive to said first single discrete velocity value and to said second plurality of selected velocity values produced by said first means and to at least one of the signals produced by said second means for producing a signal equal to their sum.

4,638,231

ROBOTIC COLLISION SENSORS AND COMPLIANCE DEVICES

Mathew L. Monforte, Hamilton, N.J., assignor to Monforte Robotics, Inc., Trenton, N.J.

Filed Dec. 6, 1984, Ser. No. 678,997
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—640 **12 Claims**



1. A collision sensor and compliance device for use with a computer controlled robotic arm adapted to have a robotic hand disposed on the distal end thereof, comprising:

(a) housing means disposed between said robotic arm and said robotic hand, said housing means having;

(i) affixment means for affixing said housing means to the distal end of said robotic arm,

(ii) a front and rear wall and a pair of side walls, each of said walls being provided with a pair of generally triangularly-shaped apertures, each of said apertures being disposed proximate the distal ends of each of said walls and in a common plane, the apex of each said triangularly-shaped aperture being positioned equidistant from the lower edges of each of said walls,

(iii) light emitting means centrally disposed in one pair of said oppositely disposed walls;

(b) means disposed proximate the distal end of said robotic hand for attaching said robotic hand to said housing means, said attaching means having;

(i) bracket means for affixment to said robotic hand, said bracket means including at least a pair of bearing means disposed at right angles to each other adapted to be received and cooperate with a pair of said triangularly-shaped apertures provided in said housing, and bearing means having free movement within said apertures,

(ii) spring means having one end thereof affixed to said bracket means and the other end thereof affixed to said housing means for urging each of said bearing means to the same relative position in each of said apertures,

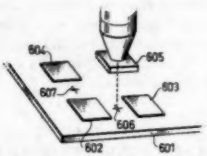
(iii) light sensing means disposed in said bracket means in alignment with said light emitting means disposed in a pair of said housing walls for providing an electrical signal when aligned therewith and not providing an electrical signal when misaligned therewith.

4,638,232

METHOD AND APPARATUS FOR CALIBRATING A POSITIONING SYSTEM

Lennart Stridsberg, Enskede, and Gunnar Rodin, Bromma, both of Sweden, assignors to Mydata Automation AB, Stockholm, Sweden

PCT No. PCT/SE85/00021, § 371 Date Aug. 30, 1985, § 102(e) Date Aug. 30, 1985, PCT Pub. No. WO85/03368, PCT Pub. Date Aug. 1, 1985
PCT Filed Jan. 18, 1985, Ser. No. 776,111
Claims priority, application Sweden, Jan. 20, 1984, 8400287
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—640 **3 Claims**



1. In a positioning system of the type which includes a positioning device for positioning an object against a work surface, a control unit for controlling said positioning device, and means for sensing the location of the positioning device and providing a signal to said control unit, a method of calibrating the system comprising the steps of:

providing a calibration board made of electrically insulating materal and having a plurality of calibration points and associated electrically conducting test areas at predetermined respective locations on a surface of said board which corresponds to a work surface;

entering the coordinate values of said calibration points into said control unit;

positioning said calibration board with said positioning device so as to bring an electrically conducting calibration component which corresponds to said object against said surface of said board at a location which nominally corresponds to the center of one of said calibration points entered into the control unit;

moving said calibration board and said calibration component relative to one another along a coordinate axis and determining the location of two extreme positions on said axis at respective opposite sides of said one calibration point by detecting test areas associated with said one calibration point;

determining the actual center of said one calibration point from said extreme positions;

comparing the actual center with the value that was entered into said control unit for said calibration point; and

storing any difference between the actual and entered values for subsequent use in compensating for errors in the positioning system.

4,638,233

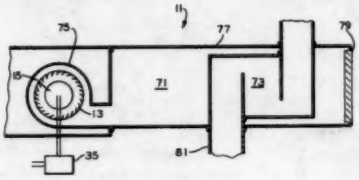
METHOD OF ESTABLISHING A PREFERRED RATE OF AIR FLOW, METHOD OF DETERMINING TORQUE, AND APPARATUS

David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 24, 1985, Ser. No. 791,026

Int. Cl.[4] G05D *7/06*; H02P *6/02*

U.S. Cl. 318—644 **19 Claims**



17. A method of determining torque of an electronically commutated motor arranged to drive a blower means for flowing air through a contained space, the electronically commutated motor and the blower means having a combined predetermined inertia, the method comprising the steps of:

applying power to the electronically commutated motor and accelerating thereby the blower means to a predetermined speed;

removing power from the electronically commutated motor and decelerating thereby the blower means; and

measuring the deceleration of the blower means and calculating the torque of the electronically commutated motor from the measured deceleration.

4,638,234

APPARATUS FOR PERFORMING REMOTELY-MANIPULATED MAINTENANCE ON PARTS OF EQUIPMENT IN A SHIELDED NUCLEAR FACILITY

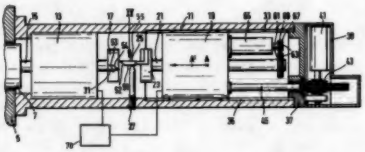
Günter Schröder, Minden-Dützen, and Helmut Berning, Bochum, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,385

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434934

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—661 **8 Claims**



1. In a remotely-operable handling arrangement for use in a radioactively-loaded large-area cell of a facility for processing irradiated nuclear fuel, the arrangement including an industrial robot having a robot joint connecting two arms, a process computer for controlling the robot and an apparatus for monitoring the position of one of the arms of the robot joint, the apparatus comprising:

a first resolver for sensing the angular position of said one arm relative to the other one of said arms;

said robot joint having a drive shaft fixedly attached to said one arm and rotatably journalled in said other one of said arms;

said first resolver having a first shaft connected to said drive shaft so as to be rotatable therewith;

first contact engaging means arranged on said first shaft;

zero mark means fixedly mounted on said other arm;

a second resolver mounted coaxially to said first shaft for ascertaining the true position of said one arm, said second resolver having a second shaft;

second contact engaging means mounted on said second shaft for engaging said zero mark means when said second shaft is rotated thereby defining the rest position; and,

drive means for rotatively driving said second shaft so as to bring said second contact means from said rest position into contact engagement with said first contact engaging means thereby providing an indication of the true position of said one arm.

4,638,235

MOTOR DRIVING APPARATUS

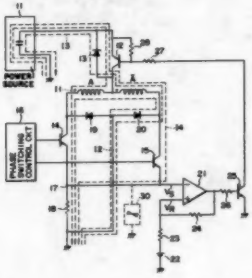
Masahiko Ogura, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 26, 1985, Ser. No. 716,134

Claims priority, application Japan, Mar. 27, 1984, 59-59025

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **2 Claims**



1. An apparatus for driving a stepper motor with first and second stator windings inductively connected to each other, said apparatus comprising:

a power source section for supplying an excitation current to the first and second stator windings;

first switching means connected between one end of said power source section and the node of the first and second stator windings;

second switching means connected at one end to the other end of the first stator winding and at the other end to the other end of said power source section;

third switching means connected at one end to the other end of the second stator winding and at the other end to the other end of said power source section;

first and second diodes so arranged as to be biased in the opposite directions by said power source section, said first diode being connected between one end of the first stator winding and the other end of said power source section, and said second diode being connected between the other end of the second stator winding and the other end of said power source;

current detecting means for detecting a current flowing through said first and second stator windings;

reference means for selectively producing a first reference level and a second reference level less than half of the first reference value according to a conductivity state of said first switching means;

comparing means connected to said current sensing means and said reference means for comparing the current detected by said current detecting means with one of the first

and second reference values output by said reference means; and

switching control means for turning on and off said first switching means in accordance with the result of the comparison performed by said comparing means.

4,638,236

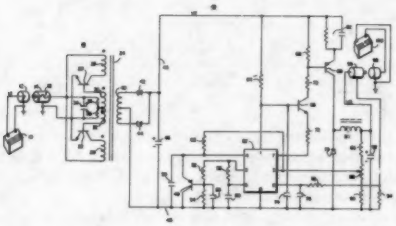
DC TO DC BATTERY CHARGER

Francis L. Carr, Downers Grove, and Larry R. Terrill, Bloomingdale, both of Ill., assignors to A. G. Busch & Co., Inc., Chicago, Ill.

Filed Nov. 8, 1984, Ser. No. 669,663

Int. Cl.[4] H02J 7/00

U.S. Cl. 320—21 **1 Claim**



1. A DC to DC battery charger for a vehicle comprising:

adapter plug means for making electrical connections to a first battery through a cigarette lighter socket in said vehicle;

means for making electrical connections to a second battery to be charged;

a DC to AC converter and an AC to DC rectifier for elevating the voltage from said first battery to a voltage above that of said second battery;

integrated circuit means for generating a pulse width modulated current as a function of the charged condition of said second battery;

transistor switch means supplied with said pulse width modulated current for developing a charging voltage;

a choke coil and a capacitor serially connected to said transistor switch means; and

a diode connected across said choke coil and said capacitor whereby said capacitor is charged during pulses of current from said transistor switch means through said choke coil, said choke coil reversing polarity at the termination of said pulses of current and continuing to charge said battery through said diode, said DC rectified voltage being controlled by said integrated circuit means for regulating current through said choke coil.

4,638,237

BATTERY CONDITION INDICATOR

Emilio A. Fernandez, Fairfax County, Va., assignor to Pulse Electronics, Inc., Rockville, Md.

Filed Jan. 3, 1985, Ser. No. 688,327

Int. Cl.[4] H02J 7/00

U.S. Cl. 320—48 **8 Claims**

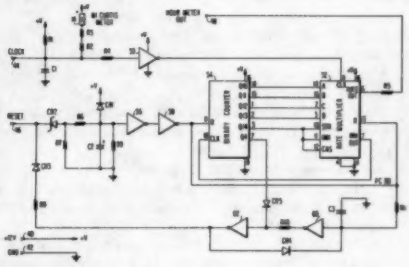
1. A battery condition indicator for indicating both the charge used and the life remaining in a rechargeable battery comprising:

rate multiplying and counting means for indirectly measuring the charge used by the battery between charges;

means for supplying variable rate clock pulses to said rate multiplying and counting means, the rate of said clock pulses being a function of whether a high current consumption load is connected to the battery or not;

timing means for measuring the total time in service of the battery;

charge used display means responsive to said rate multiplying and counting means for providing an indication of the charge remaining in the battery; and



age display means responsive to said timeing means for providing an indication of the life or age of the battery.

4,638,238

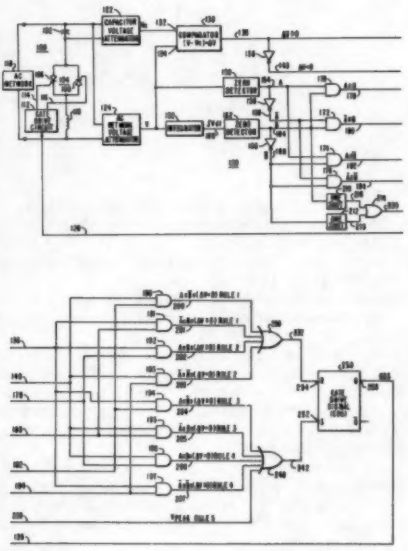
SWITCHING TECHNIQUE FOR THYRISTOR-SWITCHED CAPACITORS TO ACHIEVE NETWORK DAMPING

Laszlo Gyugyi, Penn Hills Township, Allegheny County, and Mark G. Gernhardt, Herminie, both of Pa., assignors to Westinghouse Electric Corp, Pittsburgh, Pa.

Filed Oct. 15, 1985, Ser. No. 787,283

Int. Cl.[4] H02J 3/18

U.S. Cl. 323—211 **8 Claims**



1. In a static VAR generator for providing reactive power compensation to an ac network and including a thyristor-switched capacitor bank having a series combination of a capacitor, a bidirectional thyristor switch having gate drive, and a current limiting reactance with an applied voltage V appearing across the combination with a current being conducted therethrough and a voltage Vc appearing across the capacitor, a method for switching the thyristor switch to

achieve damping of oscillatory transients generated by the switching of the capacitor in the network, comprising:

determining the magnitude and polarity of a voltage difference Δv defined by the formula $\Delta v=(V-Vc)$;

determining the occurrence of the prepeak quadrant and the postpeak quadrant of the applied voltage V;

removing the gate drive of the thyristor switch

(a) during the prepeak quadrant of the applied voltage V when the polarity of Δv is opposite to the polarity of the applied voltage V;

(b) during the postpeak quadrant of the applied voltage V when the polarity of Δv is the same as that of the applied voltage V; and

applying the gate drive of the thyristor switch

(a) during the prepeak quadrant of the applied voltage V when the polarity of Δv is the same as the polarity of the applied voltage V;

(b) during the postpeak quadrant of the applied voltage V when the polarity of Δv is opposite to that of the applied voltage V; and

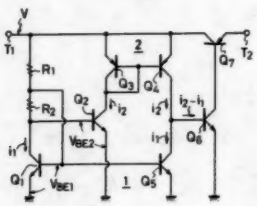
(c) at the occurrence of the voltage peak of the applied voltage V.

4,638,239

REFERENCE VOLTAGE GENERATING CIRCUIT

Takeshi Hachimori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 10, 1986, Ser. No. 817,555
Claims priority, application Japan, Jan. 24, 1985, 60-11542
Int. Cl.[4] G05F 3/20
U.S. Cl. 323—281 **5 Claims**



1. A reference voltage generating circuit comprising:

an input terminal for receiving a power supply source voltage susceptible to variation;

an output terminal from which a stable output voltage is to be derived;

a control transistor having a collector-emitter path connected between said output terminal and said input terminal;

a current detection transistor having a collector-emitter path connected in series with a series circuit of first and second resistors between said output terminal and the ground, said current detection transistor having a base connected to a connection point in said series circuit between said first and second resistors;

a third transistor having a base-emitter path connected in parallel to said collector-emitter path of said current detection transistor and having an emitter periphery area n times an emitter periphery area of the current detection transistor;

a fourth transistor of the same conductivity type as said current detection transistor and having a base connected to said base of said current detection transistor; and

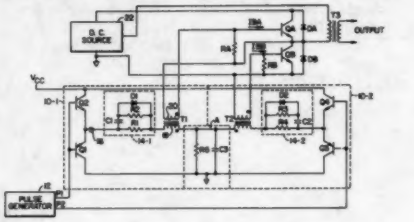
detecting means for detecting a difference between a signal corresponding to a collector current of said third transistor and a signal corresponding to a collector current of said fourth transistor and providing to a base of said control transistor a negative feedback signal corresponding to said difference.

4,638,240

BASE DRIVE CIRCUIT FOR HIGH-POWER SWITCHING TRANSISTOR

Armando Pauker, Sunnyvale, and Richard B. Preuit, Cupertino, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Dec. 5, 1985, Ser. No. 805,497
Int. Cl.[4] H02P 13/20; H02M 3/335
U.S. Cl. 323—289 **20 Claims**



1. A wave-shaping circuit for producing a base drive current to be applied to a power switching transistor by a coupling transformer, the current being produced in response to a control pulse, the circuit comprising:

an input terminal adapted to receive the control pulse;

a first resistance coupling the input terminal to the primary winding of the coupling transformer;

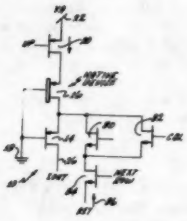
variable impedance means coupled to the first resistance for varying the impedance between the input terminal and the primary winding in response to the control pulse.

4,638,241

REGULATED CURRENT SUPPLY

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Sep. 13, 1985, Ser. No. 775,524
Int. Cl.[4] G05F 3/08
U.S. Cl. 323—312 **22 Claims**



1. In combination for providing a regulated flow of current,

a first semi-conductor,

a second semi-conductor constituting a native device relative to the first semi-conductor,

a third semi-conductor,

the first, second and third semi-conductors being connected in a series circuit,

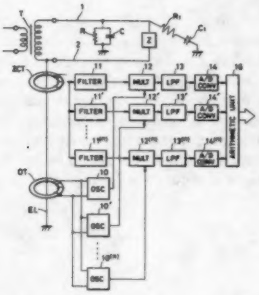
means for biasing the third semi-conductor to a state of conductivity, and

means for commonly biasing the first and second semi-conductors to obtain a saturated flow of current through the first and second semi-conductors when the third semi-conductor is conductive.

4,638,242
METHOD AND DEVICE FOR MEASURING INSULATION DETERIORATION OF ELECTRIC LINE

Tatsuji Matsuno, Samukawa, Japan, assignor to Toyo Communication Equipment Co., Ltd., Kanagawa, Japan

PCT No. PCT/JP82/00251, § 371 Date Aug. 4, 1983, § 102(e) Date Aug. 4, 1983
PCT Filed Jul. 1, 1982, Ser. No. 522,175
Claims priority, application Japan, Jul. 1, 1981, 56-103718
Int. Cl.[4] G01R 27/00
U.S. Cl. 324—51 7 Claims



7. An improved method for measuring insulation resistance of electric line in which a measuring signal of low frequency is applied to the electric line, an effective component of the measuring signal returned to an earth line of the electric line is measured in an operating state of said electric line, and the insulation resistance is calculated based on said effective component, said improved method characterized in that

low frequency signals of at least two mutually different frequency are first applied to the electric line as said measuring signal;

effective components returned to an earth line of each said low frequency measuring signals are measured;

whether or not effective components values calculated corresponding to said measuring signals of said at least two mutually different frequencies are identical is determined, and if the two insulation resistance values are identical, then these values are adopted as the insulation resistance of the electric line;

else if the two insulation resistance values are different, then a predetermined operation is executed based on an effective component value calculated corresponding to a measuring signal of further different frequency together with said two effective component values so as to obtain the insulation resistance of the electric line.

4,638,243
SHORT DETECTOR FOR FUSIBLE LINK ARRAY USING SINGLE REFERENCE FUSE

Andrew K. Chan, Milpitas, Calif., assignor to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Jun. 5, 1985, Ser. No. 741,658
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—51 5 Claims

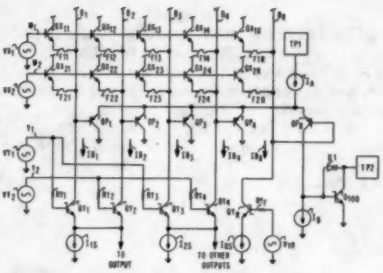
1. Circuitry for testing for short circuits in a fusible link array, said array having a plurality of discrete fusible links each having a nominal resistance RF, any short circuits in one of said fusible links presenting a resistance RFS which is substantially lower than RF, said circuitry comprising:

means for electrically isolating one of said fusible links from the other of said links;

a reference fusible link having a nominal resistance RF;

a reference voltage circuit, said reference fusible link being connected in said reference voltage circuit;

means for applying a voltage across the one of said fusible links under test and across said reference fusible link; and

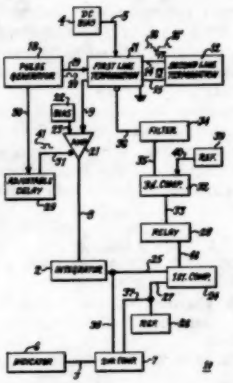


means for comparing the voltage across said fusible link under test with the voltage across said reference fusible link to provide an indication of the presence or absence of a short circuit across said fusible link under test.

4,638,244
GROUND CONNECTION MONITOR

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,644
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—51 13 Claims



1. Apparatus for monitoring the continuity of a pair of conductors in a multiconductor cable comprising:

pulse generating means for transmitting a pulse of a first polarity from a first line termination at one end of said conductors along said pair of conductors;

means for receiving said pulse upon reflection from a second line termination at an opposite end of said conductors and for comparing the polarity of said received pulse relative to said transmitted pulse;

means connected with said comparison means for providing a response in accordance with said comparison;

said means connected with said comparison means providing said response when said reflected pulse arrives at said receiving means with a predetermined polarity and at a predetermined time after said transmitted pulse; and

said receiving means including an amplifier connected at one of its inputs to said first line termination and at another of its inputs to a DC reference for amplifying said received

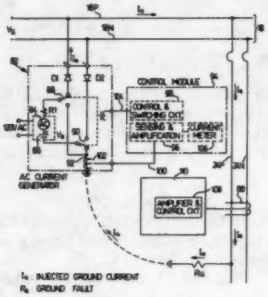
pulse when said received pulse is of a predetermined polarity.

4,638,245

DETECTION OF GROUND FAULTS IN UNGROUNDED DC POWER SUPPLY SYSTEMS

Colin A. A. MacPhee, Scarborough, and Ohjhong Yoon, Markham, both of Canada, assignors to Federal Pioneer Limited, Toronto, Canada

Filed Jan. 8, 1985, Ser. No. 689,698
Claims priority, application Canada, Sep. 27, 1984, 464177
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—51 **9 Claims**



1. Apparatus for detecting a ground fault in an ungrounded DC power supply system having a DC power supply connected by positive and negative lines to a load, comprising:

means for applying an AC voltage selectively between a positive line and ground or between a negative line and ground, and

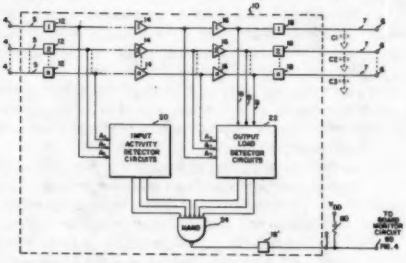
current sensing means comprising an electrical coil surrounding said positive and negative lines and responsive to significant alternating current in one of said lines, when said AC voltage is applied to said one line and said one line has a ground fault, to thereby indicate said fault.

4,638,246

INTEGRATED CIRCUIT INPUT-OUTPUT DIAGNOSTIC SYSTEM

Hans G. Blank, Chestnut Hill, and Jeffrey R. Fox, Concord, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 21, 1984, Ser. No. 653,441
Int. Cl.[4] G01R *17/02*
U.S. Cl. 324—73 R **11 Claims**



2. A circuit chip defect detection system for detecting open circuits associated with chip input pads wherein external input signals of predetermined frequency are coupled to the chip input pads; comprising:

(a) an input circuit defect detector having:

(i) an integrator circuit coupled to the chip input pad for integrating the input signals over the predetermined time period of said input signal;

(ii) comparator means for comparing the integrated signal with a predetermined reference signal and providing an output signal of one of two possible states depending upon whether the integrated signal is less than the reference signal or is equal to or greater than the reference signal.

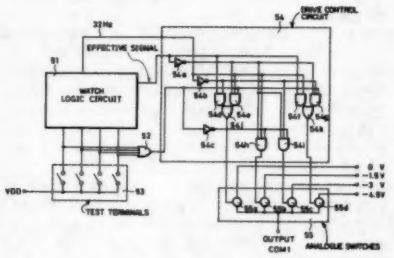
11. An output circuit fault monitoring circuit in which a dummy circuit is connected to the output circuit which dummy circuit is a scaled-down version of the output circuit and has a time delay intermediate that of the output circuit operating into a connected output pad and that of the output circuit when operating into a disconnected output pad; and means for determining the time of arrival of the dummy circuit signal in relation to that of the actual output signal to indicate the presence or absence of a disconnected output pad.

4,638,247

INTEGRATED CIRCUIT FOR CONVERTING A DRIVE SIGNAL OF THREE OR MORE VOLTAGE LEVELS TO TWO VOLTAGE LEVELS

Takehiro Ishikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,269
Claims priority, application Japan, Sep. 16, 1981, 56-145887
Int. Cl.[4] G01R *15/12*
U.S. Cl. 324—73 R **2 Claims**



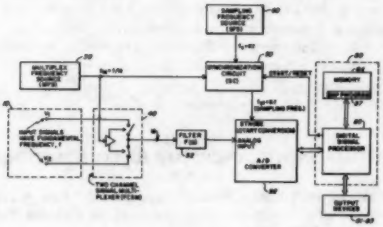
1. An integrated circuit capable of producing a first signal of at least three voltage levels at an output terminal thereof for driving a liquid crystal during a normal mode of operation and capable of changing the first signal to a second signal of two voltage levels for use in testing the first signal during a test mode of operation, the integrated circuit comprising: a logic circuit for generating a reference signal and an effective signal to control the driving of a liquid crystal; testing means for producing a test signal during the test mode of operation; drive control circuit means for receiving said reference signal and said effective signal and operative to produce normal drive control signals in the absence of said test signal and operative to produce test drive control signals in response to said test signal; and analogue switch means responsive to the drive control signals for producing the said first signal of at least three voltage levels when said testing means does not produce said test signal and for producing the said second signal of two voltage levels when said testing means produces said test signal.

4,638,248

METHODS AND APPARATUS FOR MEASURING RELATIVE GAIN AND PHASE OF VOLTAGE INPUT SIGNALS VERSUS VOLTAGE OUTPUT SIGNALS

Robert K. Schweickert, Colorado Springs, Colo., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 10, 1985, Ser. No. 743,165
Int. Cl.[4] G01R *19/00*
U.S. Cl. 324—76 R 10 Claims



1. Apparatus for determining the relative gain and phase of two analog input electrical signals comprising:

(a) multiplexing means for time-division multiplexing the two analog signals at a predetermined rate;

(b) converter means for converting the multiplexed analog signals to digital signals;

(c) storage means for storing said digital signals;

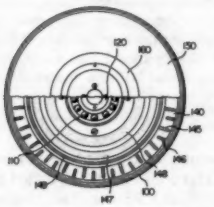
(d) processor means for demultiplexing the stored digital signals at said predetermined rate and for reconstructing such signals into two separate digital signals corresponding to the two separate analog input signals.

4,638,249

INCREMENTAL ENCODER ROTATIONAL POSITION DETECTOR

Hiroaki Tanaka, and Shigeyuki Akita, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 18, 1982, Ser. No. 340,254
Claims priority, application Japan, Jan. 22, 1981, 56-7524[U]
Int. Cl.[4] G08C *19/10*
U.S. Cl. 324—166 2 Claims



1. An incremental rotational position detector of electrostatic capacitance type comprising:

a first plate including a first electrode having a plurality of electrode pieces arranged radially at equal spatial intervals to each other, a second electrode having a plurality of electrode pieces arranged radially between said electrode pieces of said first electrode, annular third and fourth electrodes, and an annular earth electrode arranged between said first and third electrodes and set to the earth potential;

a second plate including 5th, 6th, 7th and 8th electrodes arranged in opposed relation to said first, second, third and fourth electrodes of said first plate respectively, said 5th electrode and said 7th electrode of said second plate being electrically connected to each other, said 6th electrode and said 8th electrode of said second plate being electrically connected to each other; and

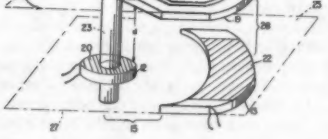
a detector circuit for supplying signals of opposite phases to selected one of the pair of said first and second electrodes of said first plate and the pair of said third and fourth electrodes thereof, so that the change of the electrostatic capacitance generated between the electrodes of said plates when said second plate is rotated in relation with said first plate is detected thereby to detect an incremental rotational position of said second plate.

4,638,250

CONTACTLESS POSITION SENSOR WITH CORELESS COIL COUPLING COMPONENT

Chaim D. Shen-Orr, and Eitan Berg, both of Haifa, Israel, assignors to Fiscint, Inc., Boston, Mass.

Filed Jan. 30, 1984, Ser. No. 574,974
Int. Cl.[4] G01B *7/14;* G08C *19/06*
U.S. Cl. 324—207 28 Claims



1. A magnetic position sensor for monitoring the change of position of an element in a contactless manner, said sensor comprising:

(a) a magnetic field generator component through which a varying current flows for inducing a first varying magnetic field;

(b) a magnetic field coupling component including an untuned coreless coil mounted to be magnetically coupled to the magnetic field generator component and to have current induced therein by said first varying magnetic field, said induced current generating a second varying magnetic field;

(c) a magnetic field sensor component magnetically coupled to said magnetic field coupling component through said second varying magnetic field;

(d) means for mounting the magnetic field coupling component to said element to move with said element relative to said other two components, the degree of magnetic coupling between said coupling component and the magnetic field generator component being substantially independent of the movement of said element while the degree of magnetic coupling between said coupling component and the magnetic field sensor component being a function of the movement of said element; and

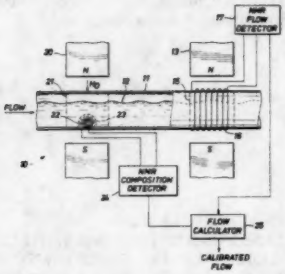
(e) means for measuring the signal induced in said magnetic field sensor component by the said second varying magnetic field for indicating the position of the element whose change in position is being monitored.

4,638,251

METHOD AND APPARATUS FOR MEASURING FLOW OF NON-HOMOGENEOUS MATERIAL IN INCOMPLETELY FILLED FLOW CHANNELS

James D. King, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Oct. 29, 1984, Ser. No. 665,669
Int. Cl.[4] G01R *33/20*; G01F *1/56*; G01N *24/08*
U.S. Cl. 324—306 19 Claims



1. A flow measuring apparatus cooperative with a flow stream of non-homogeneous material wherein the volume thereof fluctuates to less than the full volume of the conduit for the flowing stream, the apparatus comprising:

(a) a nuclear magnetic resonance flow detector including a magnet forming a field in a sensitive region of the flow stream and also including a first detection coil for detecting the population of a particular nuclear species within that sensitive region and forming an output signal indicative of the flow velocity thereof;

(b) a second coil comprising a composition sensor positioned relative to the flowing material and defining a sensitive volume therein in conjunction with a cooperative magnetic field intensity, thereby defining a sensitive region for said second coil, said second coil being positioned relative to the flowing material to be fully filled during measurements with the flowing material, said second coil being connected with a nuclear magnetic resonance composition detector means forming an output signal indicative of the concentration of the selected nuclear species in the flowing material; and

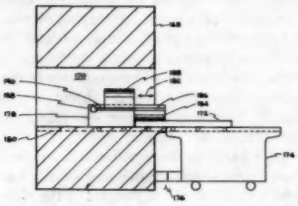
(c) flow calculator means provided with the output (1) from said composition detector means and (2) from said flow detector to form an output indicative of the quantity of flowing non-homogeneous materials without regard to the volume filling the sensitive region of said flow detector.

4,638,252

CIRCUIT FOR DETECTING RF COIL ASSEMBLY POSITION IN AN MR SCANNER

Kenneth M. Bradshaw, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 21, 1984, Ser. No. 684,553
Int. Cl.[4] A61B *5/05*
U.S. Cl. 324—318 3 Claims



1. An MR scanner including an RF power amplifier, an RF receiver preamplifier, and an RF coil assembly made up of an upper coil assembly disposed slidably relative to a lower coil assembly, said MR scanner comprising:

transmit/receive switch means having a plurality of switching devices for selectively coupling said power amplifier and said preamplifier to said coil assembly;

switch means operably coupled to said upper coil assembly to shunt at least one of said switching devices in and out of said transmit/receive switch depending on the position of said upper coil assembly so as to change the voltage drop across one of the unshunted switching devices; and

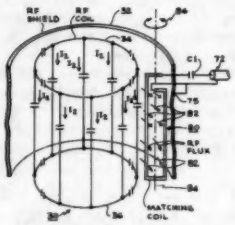
comparator circuit means for comparing said voltage drop to a predetermined reference voltage and providing an output signal indicative of the position of said upper coil assembly.

4,638,253

MUTUAL INDUCTANCE NMR RF COIL MATCHING DEVICE

Patrick L. Jaskolski, Wauwatosa, and Matthew G. Eash, Oconomowoc, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 29, 1984, Ser. No. 665,487
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 8 Claims



1. An NMR scanner apparatus comprising:

RF coil means for transmitting and receiving radio frequency signals;

first means for energizing said RF coil means when said coil is operated in the transmitting mode;

means for receiving radio frequency signals when said coil is operated in the receiving mode; and

first matching coil means for coupling said RF coil means to said means for energizing and means for receiving said matching coil means being disposed in the magnetic flux field of said RF coil, such that in operation said matching coil means and said RF coil means are coupled by mutual inductance.

4,638,254

METHOD OF DETERMINING AND DISPLAYING THE ORIENTATION OF SUBSURFACE FORMATIONS

Duane C. Uhri, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,919
Int. Cl.[4] G01V *3/38*
U.S. Cl. 324—323 13 Claims

1. The method of producing a plot of preferred geological orientation of a subsurface formation comprising:

(a) repeatedly measuring said geological orientation;

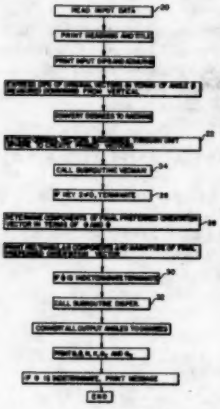
(b) generating original vectors representing the azimuth and dip of the measurements;

(c) converting said original vectors into lineations representing the extension of each vector to its intersection with a unit sphere;

(d) designating one of said original vectors as a reference vector;

(e) selecting the half axes of all lineations within 90° of the reference vector and transforming them into unit vectors;

(f) vector averaging the selected unit vectors to produce a resultant vector;
(g) determining the magnitude of said resultant vector;
(h) repeating steps (c)–(f) for each of said original vectors;
(i) selecting the resultant vector having the maximum magnitude as the preferred orientation of said formation;



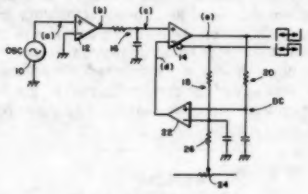
(j) repeating steps (b)–(i) for a plurality of measurements; and
(k) plotting the resultant vectors having maximum magnitudes.

4,638,255

RECTANGULAR WAVE PULSE GENERATORS

Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 537,999, Sep. 30, 1983, abandoned. This application Nov. 25, 1985, Ser. No. 801,268
Int. Cl.[4] H03K *3/017, 3/023, 5/153*
U.S. Cl. 328—36 **9 Claims**



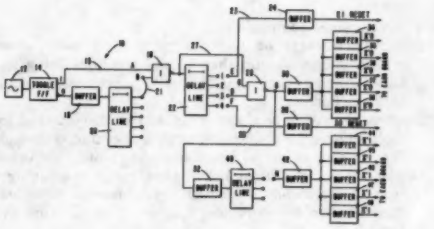
1. Signal processing apparatus comprising:
an electronic device having a signal input, a signal output and a clock input;
a circuit having an output at which it provides a first train of voltage pulses;
means for converting said first train of voltage pulses into a second train of voltage pulses each having a trailing edge and a leading edge, at least one of said edges being of generally ramp-like form;
a comparator having a first input to which said second train of voltage pulses is applied, a second input to which a reference d.c. voltage level is applied and an output at which is developed a periodic rectangular wave signal having a duty cycle which is a function of the reference d.c. voltage level, the periodic rectangular wave signal being input to the clock input of said electronic device such that said electronic device is clocked by the periodic rectangular wave signal in a time relationship to said first train of voltage pulses that is adjustable in dependence upon said reference d.c. voltage level; and
means for generating the reference d.c. voltage level from the periodic rectangular wave signal.

4,638,256

EDGE TRIGGERED CLOCK DISTRIBUTION SYSTEM

Vuong B. Hong, Laguna Hills; Stuart C. Rowson; Richard A. Daniel, both of Escondido, and Paul M. Rostek, San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 15, 1985, Ser. No. 765,770
Int. Cl.[4] H03K *5/15*
U.S. Cl. 328—105 **7 Claims**



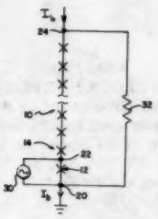
1. A clock distribution system comprising:
a generator for generating a train of pulses;
transition means connected to the output of said generator for generating a clock signal having spaced apart transitions of a desired polarity;
distribution means distributing said clock signal to a plurality of boards which utilize said clock signal;
flip-flop means on each of the boards which utilize said clock signal, each of said flip-flop means being connected to said distribution means for receiving said clock signal and for generating clock pulses defined by said spaced apart transitions;
reset pulse generating means connected to said generator means for generating reset pulses after every second transition of a desired polarity;
reset means in said flip-flop means for receiving said reset pulses and for resetting said flip-flop means to a desired state after every one of said clock pulses;
alternate clock signal means in said transition means for additionally generating an alternate clock signal having two alternate transitions of a desired polarity after every second transitions of said clock signal;
alternate flip-flop means in said flip-flop means for receiving said alternate clock signal and for generating alternate clock pulses each defined by said two alternate transitions;
alternate reset pulse generating means connected to said generator means for generating alternate reset pulses after every second one of said alternate transitions;
alternate reset means in said alternate flip-flop means for receiving said alternate reset pulses and for resetting said alternate flip-flop means to a desired state after every one of said alternate clock pulses;
first delay line means in said transition means for delaying the alternate clock signal so as to time the alternate clock pulses of said alternate flip-flop means centrally between adjacent ones of said clock pulses.

4,638,257

AMPLIFICATION BY A PHASE LOCKED ARRAY OF JOSEPHSON JUNCTIONS

Donald G. McDonald, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Nov. 26, 1985, Ser. No. 801,972
Int. Cl.[4] H03F *19/00*
U.S. Cl. 330—61 R **8 Claims**



1. An amplifier comprising:

an array of n Josephson junctions connected in series, where n is an integer greater than 1, said junctions being in a finite voltage state and mutually electromagnetically phase locked;

input means having m of said Josephson junctions connected therebetween for connecting an input signal to said amplifier, m being an integer less than n and greater than 0; and

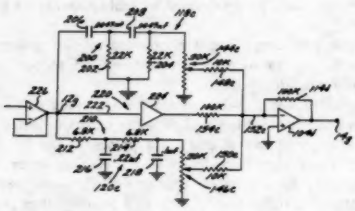
output means including impedance load means and having at least m+1 Josephson junctions of said series connected therebetween for providing an output signal from said amplifier.

4,638,258

REFERENCE LOAD AMPLIFIER CORRECTION SYSTEM

Robert C. Crooks, Huntington Beach, Calif., assignor to Barcus-Berry Electronics, Inc., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 352,794, Feb. 26, 1982, Pat. No. 4,482,866. This application Nov. 7, 1984, Ser. No. 669,071
Int. Cl.[4] H03F *1/08*
U.S. Cl. 330—149 **18 Claims**



1. A method of correcting for variations in a load having inductive reactance and characteristics resembling those of capacitive reactance, which load is driven by a power amplifier that has an input circuit line through which it receives a variable waveform input program voltage signal, which comprises:

applying said program signal in a separate high frequency channel to inductor correction component high pass phase shifting network means to produce a high frequency correction signal which has a phase lead and frequency response that increase with increasing frequencies so as to compensate for inductive reactance of said load,

applying said program signal in a separate low frequency channel to capacitor correction component low pass phase shifting network means to produce a low frequency correction signal which has a phase lag and frequency response that increase with decreasing frequencies so as to compensate for characteristics of said load which resemble capacitive reactance,

passing said program signal through a separate midrange channel having midrange band pass filter means therein, and

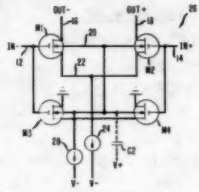
after said program signal has passed through said midrange channel, mixing said high and low frequency correction signals with said program signal and applying such mixture of signals to said power amplifier.

4,638,259

CMOS DIFFERENTIAL AMPLIFIER STAGE WITH BULK ISOLATION

Veikko R. Saari, Spring Lake Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1985, Ser. No. 814,199
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **6 Claims**



1. In a differential amplifier of the type having:

first and second field-effect transistors having one side of their conduction paths connected to a first current source, the control electrodes of the first and second transistors being first and second input nodes, respectively, and the other side of the conduction paths of the first and second transistors being first and second output nodes, respectively,

The improvement therein comprising:

third and fourth field-effect transistors having one side of their conduction paths connected to the bulk regions of the first, second, third and fourth transistors and to a second current source, the control electrodes of the third and fourth transistors being connected, respectively, to the control electrodes of the first and second transistors, and the other side of the conduction path of the third and fourth transistors being connected to a common reference voltage.

4,638,260

AUDIO AMPLIFIER

James P. Hamley, 2922 Cottonwood Dr. South, Mill Creek, Wash. 98012

Filed Sep. 21, 1984, Ser. No. 652,722
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—254 **34 Claims**

1. An audio amplifier comprising:

an input stage for receiving a signal to be amplified;

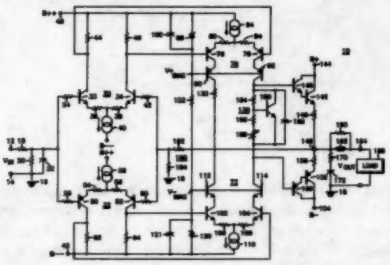
an intermediate stage for gain amplifying the signal from the input stage; and,

an output stage, adapted to be coupled to a load, for power amplifying the signal from the intermediate stage,

wherein said input stage comprises a complementary-symmetry, differential amplifier pair, each differential amplifier having first and second output terminals, said signal to be amplifier being coupled to the first input terminal of each of said amplifiers;

wherein said intermediate stage comprises a complementary-symmetry, cascode differential amplifier pair, each

intermediate stage amplifier pair having first and second input terminals coupled to the first and second output terminals of one of said input stage differential pairs, and each intermediate stage having first and second output terminals;



wherein said output stage comprises power amplifier means connected to at least one of said output terminals from each of said intermediate stage amplifiers for power amplifying the signal thereon; and

a feedback circuit coupled from said output stage to the second input terminal of each of said input stage differential amplifiers for applying a feedback signal thereto.

4,638,261

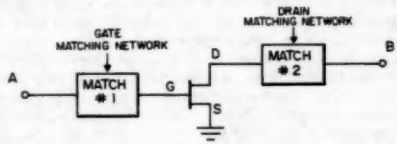
LOW NOISE AMPLIFIER WITH HIGH INTERCEPT POINT

Charles F. McGuire, Kaysville; Gordon C. Steyaert, Salt Lake City, both of Utah, and John M. Fontaine, Scottsdale, Ariz., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 26, 1985, Ser. No. 769,377

Int. Cl.⁴ H03F *3/60*

U.S. Cl. 330—277 **6 Claims**



1. A low noise, high intercept point, single ended, linear amplifier comprising,

a field effect transistor including a gate electrode, a source electrode and a drain electrode,

said transistor having large gate width parameters on the order of 3000 microns,

a gate matching network comprising a distributed dispersive media connected to the gate electrode of said transistor to present a standard noise match to said gate electrode thereby to achieve a minimum noise factor for said amplifier, and

a drain matching network comprising a distributed dispersive media connected to the drain electrode of said transistor in order to provide the optimal power load for said transistor thereby to achieve a high intercept point.

4,638,262

PROXIMITY SWITCH WITH IMPROVED RESPONSE TIME AND ANTIMAGNETIC FIELD CIRCUITRY

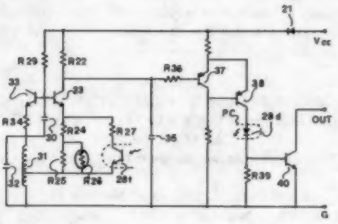
Kiyoshi Miyamoto, Otsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 8, 1985, Ser. No. 709,760

Claims priority, application Japan, Mar. 9, 1984, 59-46155; Mar. 9, 1984, 59-34740

Int. Cl.⁴ G01N *27/00*

U.S. Cl. 331—65 **11 Claims**



1. A high frequency oscillation type proximity switch having an oscillation circuit with an oscillation output and a detecting circuit for detecting an object by a decrease in the oscillation output,

wherein said oscillating circuit has an oscillation adjusting resistor for changing the oscillation amplitude,

said proximity switch comprising

comparing means for comparing the oscillation output from said oscillating circuit with a predetermined level to detect the decrease therein,

oscillation control means for changing the resistance of the oscillation adjusting resistor of said oscillating circuit on the basis of the output from said comparing means,

oscillation output discrimination means for discriminating the oscillation output from said oscillating circuit on the basis of a predetermined level to provide an output when the oscillation amplitude lowers, and

an integrating circuit for integrating the output from said output discrimination means and providing an output on the basis of which the switch detects an object.

4,638,263

VOLTAGE CONTROLLED OSCILLATOR INCLUDING TWO VARIABLE GAIN FEEDBACK CIRCUITS

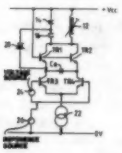
Herman W. van Rumpt, Eindhoven, Netherlands, and Charles J. H. Razzell, Cambridge, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,833

Claims priority, application United Kingdom, Oct. 7, 1983, 8326822

Int. Cl.⁴ H03B *5/12, 5/36*

U.S. Cl. 331—116 R **10 Claims**



1. A voltage controlled oscillator comprising two active

elements having respective feedback paths with each path having a different phase shift, the phase shift in one of said two paths being substantially constant, signal outputs of the two feedback paths being summed vectorially, and a tunable L.C. circuit for receiving said summed signal outputs, further comprising means for varying the gain distribution between the two feedback paths, said gain varying means comprising two control devices respectively coupled to the two active elements, and means for applying a frequency control voltage to each of the control devices to vary the distribution of the current through their associated connected active elements to alter the gain in each path whereby the total phase shift and frequency of the oscillator is modified.

4,638,264

VOLTAGE CONTROLLED OSCILLATOR WITH SERIES CONNECTED RESONANCE ELEMENT AND SWITCHED CAPACITANCE

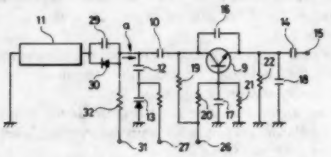
Moriaki Ueno, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 27, 1985, Ser. No. 814,187

Claims priority, application Japan, Dec. 27, 1984, 59-197795[U]

Int. Cl.⁴ H03B 5/00

U.S. Cl. 331—117 D **4 Claims**



1. A voltage controlled oscillator of the type comprising a distributed parameter line functioning as a resonance circuit, and a variable capacitance diode connected to a connection point in parallel with said distributed parameter line which has its capacitance varied by means of a control voltage,

the improvement wherein said distributed parameter line is connected in a series circuit with said connection point through a capacitor and a switching diode in parallel with said capacitor, said switching diode including a terminal for applying a bias voltage for rendering said diode conducting or non-conducting to thereby short-circuit or include said capacitor in said series circuit, respectively, whereby the resonance wavelength of said distributed parameter line can be varied without substantially varying the sensitivity of said oscillator.

4,638,265

BALANCED VARIABLE REACTANCE CIRCUIT AND METHOD OF PRODUCING THE SAME

Gerald K. Lunn, Scottsdale; W. Eric Main, Mesa, and Michael McGinn, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 3, 1985, Ser. No. 740,366

Int. Cl.⁴ H03H 7/48

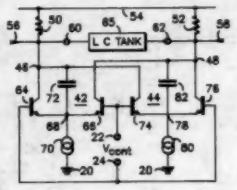
U.S. Cl. 333—214 **19 Claims**

1. A circuit for producing a controllable and variable reactance across first and second terminal, comprising:

first current steering means having a common terminal for steering first and second proportional currents to the first and second terminals from said common terminal in response to receiving an applied control signal;

second current steering means having a common terminal for steering third and fourth proportional currents to the first and second terminals from said common terminal in response to said applied control signal, said first and third currents being in antiphased relationship with respect to each other;

first reactive means coupled between the first terminal and said common terminal of said first current steering means for sourcing a first reactive current to said common terminal; and



second reactive means coupled between the second terminal and said common terminal of said second current steering means for sourcing a second reactive current to said common terminal, said second reactive current being in antiphase with said first reactive current.

4,638,266

ACOUSTOOPTICAL MODULATOR AND/OR DEFLECTOR

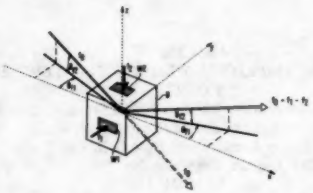
Wilfried Aüch, Asperg, and Eberhard Schlemper, Vaihingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 7, 1984, Ser. No. 669,489

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340809

Int. Cl.⁴ G02F 1/33

U.S. Cl. 332—7.51 **7 Claims**



1. An acoustooptical device comprising:

(a) an optically transparent material;

(b) means for producing a first acoustic wave of frequency f_1 and propagating said first acoustic wave into said material in a first wave propagation direction;

(c) means for producing a second acoustic wave of frequency f_2, different from said frequency f_1, and propagating said second acoustic wave into said material in a second wave propagation direction at least approximately perpendicular to said first wave propagation direction; and

(d) means for directing an incident light beam into said transparent material in a predetermined incident beam propagation direction having a component opposite to said first wave propagation direction and also having a component codirectional with said second wave propagation direction, so that Bragg reflection occurs, whereby an output light beam is provided having a frequency shift of (f_1-f_2) with respect to the frequency of the incident beam.

4,638,267

MILLIMETER WAVE CIRCULATOR

Wolfgang Holpp, Illertissen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,708

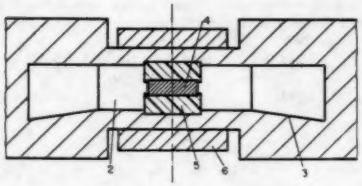
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411621

Int. Cl.⁴ H01P 1/39

U.S. Cl. 333—1.1 **5 Claims**

1. A millimeter wave circulator comprising an H-plane

waveguide junction, means defining a static magnetic field in the vicinity of said junction, a circularly cylindrical ferrite body at the center of said waveguide junction exposed to said static magnetic field, said ferrite body being dimensioned so that the operating frequency of said circulator falls within the



range of two neighboring closely spaced resonant frequencies of higher order than that of the dominant mode of said ferrite body, said two neighboring closely spaced resonant frequencies being of TE_{011} and TE_{211} modes.

4,638,268

MICROWAVE ABSORBER COMPRISED OF A DENSE SILICON CARBIDE BODY WHICH IS WATER COOLED

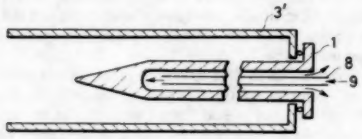
Masakazu Watanabe, and Akiyasu Okuno, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 24, 1984, Ser. No. 634,012

Claims priority, application Japan, Nov. 8, 1983, 58-171958[U]

Int. Cl.⁴ H01P *1/26*

U.S. Cl. 333—22 F **3 Claims**



1. A microwave absorber comprising: a body entirely of dense silicon carbide having two ends, wherein a hollow portion is located at one end and a closed tip end portion is located at the other end, and a pipe, for guiding cooling water into said hollow portion.

4,638,269

WIDE BAND MICROWAVE ANALOG PHASE SHIFTER

Dale E. Dawson, Glen Burnie; Anthony L. Conti, Baltimore; Soong H. Lee, Rockville, all of Md.; Gary F. Shade, and Lawrence E. Dickens, both of Colorado Springs, Colo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 28, 1985, Ser. No. 738,794

Int. Cl.⁴ H01P *1/185*

U.S. Cl. 333—164 **3 Claims**

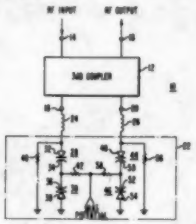
1. A microwave hybrid coupled phase shifter comprising:

(a) an insulating substrate;

(b) four conductor pads disposed upon the substrate and comprising an rf input pad, an rf output pad, and first and second phase shifting pads;

(c) a generally U-shaped, closely spaced conductor pattern disposed on the substrate and extending between the rf input pad and the rf output pad, and the first and second phase shifting pads, which conductor pattern comprises an air bridged quadrature coupler;

(d) first and second conductors disposed on the substrate and extending from respective first and second phase shifting pads to the anodes of Schottky varactor diodes, with the cathodes of said Schottky varactor diodes being serially connected to the cathodes of another set of Schottky varactor diodes to form two pairs upon said substrate; and with the anodes of the other Schottky varactor diodes of each pair being connected to a ground conductor disposed upon the substrate;



(e) bias means contact pads disposed upon the substrate with conductors extending from said contact pad to the cathodes of the Schottky varactor diode pairs, which bias means contact pad is connectable to reverse bias potential means for varying the capacitance of the Schottky varactor diode pairs and the phase of the output rf signal as a function of the reverse bias potential.

4,638,270

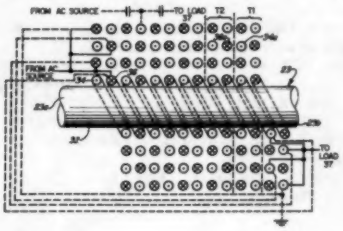
RESONATOR COMPRISING A COIL FORMED OF MULTIPLE LAYER ALTERNATELY ARRANGED CONDUCTIVE TURNS

George A. Machamer, 2201 N. Hawthorne St., Melrose Park, Ill. 60164

Filed Feb. 17, 1984, Ser. No. 581,912

Int. Cl.⁴ H03H *7/09*

U.S. Cl. 333—175 **16 Claims**



5. A resonator, comprising:

first and second conductors formed into a coil and having turns disposed in side-by-side relationship to form a first layer of alternating first and second conductor turns;

third and fourth conductors formed into a coil and having turns atop the first layer to form a second layer wherein a turn of the third conductor overlies a turn of the second conductor and a turn of the fourth conductor overlies a turn of the first conductor;

fifth and sixth conductors formed into a coil and having turns atop the second layer to form a third layer wherein a turn of the fifth conductor overlies a turn of the fourth conductor and a turn of the sixth conductor overlies a turn of the third conductor; and

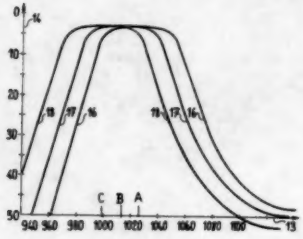
means for connecting separate conductors together in parallel to form a plurality of terminals.

4,638,271

METHOD OF INCREMENTALLY ADJUSTING THE CENTER FREQUENCY OF A MICROSTRIP-LINE PRINTED FILTER BY MANUEVERING DIELECTRIC LAYERS

Jean-René Jecko, Talence, and Marcel Motola, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed May 25, 1984, Ser. No. 614,083
Claims priority, application France, May 31, 1983, 83 09008
Int. Cl.[4] H01P *1/203*
U.S. Cl. 333—205 **3 Claims**



2. A method for fabricating a printed circuit filter having a reversibly adjustable center frequency, the method comprising the steps:

forming a plurality of microstrip resonators in generally parallel relationship on a substrate;

depositing a stack of aligned individual layers of dielectric material lengthwise along the substrate and generally perpendicularly across the parallel resonators to achieve an initial filter center frequency;

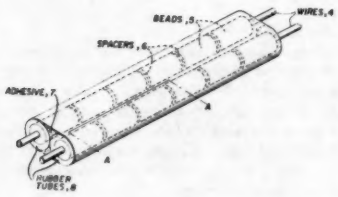
incrementally maneuvering individual ones of the dielectric layers to and from the stack corresponding to incremental center frequency shifts of the filter.

4,638,272

LOSSY TRANSMISSION LINE USING SPACED FERRITE BEADS

Richard A. Ive, Eaton Town, N.J., assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU84/00076, § 371 Date Jan. 2, 1085, § 102(e) Date Jan. 2, 1985, PCT Pub. No. WO84/04426, PCT Pub. Date Nov. 8, 1984
PCT Filed May 4, 1984, Ser. No. 692,885
Claims priority, application Australia, May 5, 1983, PF 9191/83
Int. Cl.[4] H01P *3/04*
U.S. Cl. 333—236 **8 Claims**



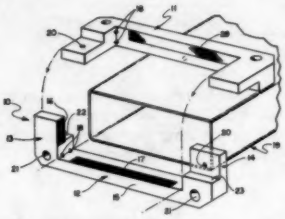
1. A lossy transmission line comprising a conducting wire threaded with resistive ferrite beads which exhibits substantially constant power loss per unit length, and wherein the resistive ferrite beads are distributed sparsely at the beginning of the wire with frequency of distribution increasing to a maximum per unit length which is related to the size of the beads and the available space per unit length of the wire.

4,638,273

WAVEGUIDE ASSEMBLY

John D. Foglesonger, Los Angeles, and David M. Vranson, Canyon Country, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,425
Int. Cl.[4] H01P *1/04*
U.S. Cl. 333—254 **4 Claims**



1. A subassembly for a waveguide joint comprising:

a metallic rectangular waveguide section having four sides forming four corners;

a compressible metallic flange for mounting to said waveguide, said flange arranged and configured for compression fitting onto said waveguide and having four interior corners; and

means for creating an electromagnetic seal at each of said four corners of said waveguide, said means creating said electromagnetic seal when said flange is compressed upon said waveguide;

wherein said means for creating an electromagnetic seal comprises a plurality of angular projections disposed on interior surfaces of said flange, said projections disposed within said interior corners of said flange and at least on both sides of each of said interior corners in order to completely engage said corners of said waveguide upon compression of said flange,

whereby said subassembly is substantially electromagnetically leak-proof upon assembly.

4,638,274

RELAY SWITCH APPARATUS

Wendel E. Archer, Gahanna; James L. Milton, Columbus, both of Ohio; Paul W. Renaut, and Nelson H. Winquist, both of Lee's Summit, Mo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 6, 1986, Ser. No. 836,681
Int. Cl.[4] H01H *1/08, 29/00*
U.S. Cl. 335—52 **8 Claims**

1. A mercury switch construction (1, 2, 3) comprising

mercury wettable magnetic contact structures (11, 12, 211, 212, 221, 222, 311, 312),

envelope means (10, 20, 30) for supporting said magnetic contact structures in a spaced apart relationship, and

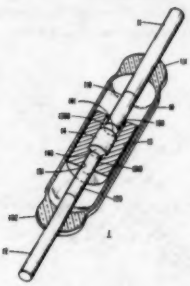
means responsible to an external magnetic field for establishing an electrical conducting path between said magnetic contact structures

characterized in that

said electrical conducting path establishing means comprises

mercury holding means (13, 23, 33) slidably located within said envelope means adjacent said magnetic contact struc-

tures and having magnetic means (14, 24, 34) attached thereto responsive to said external magnetic field for



engaging said mercury holding means with said contact structures and establishing said electrical conducting path.

4,638,275

ELECTRIC SWITCHING UNIT COMPRISING A GAS-TIGHT CASING FOR PROTECTION OF CONTACTS

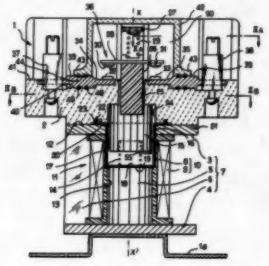
Elie Belbel, Vaucresson; Robert Caudron, Meudon; Louis Fèchant, Le Vesinet; André Haury, Le Raincy; Michel Lauraire, Courbevoie; Jacques Muniesa, Boulogne Billancourt, and Lucien Siffroi, Versailles, all of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Mar. 22, 1985, Ser. No. 714,928

Claims priority, application France, Mar. 28, 1984, 84 04826

Int. Cl.[4] H01H *1/66, 51/00*

U.S. Cl. 335—151 **13 Claims**



1. An electric switching unit comprising:

a body (2, 65),

an electromagnet (11, 80) having a stationary yoke (7, 76), a moving armature (15, 75) and a stationary excitation coil (10, 78), said electromagnet being rigidly fixed to said body through one of its stationary elements (7, 76),

a plurality of switches (36) each comprising a stationary contact member (34, 35) and a moving contact (28) which are provided with contact-studs (30, 31, 32, 33), the moving contacts being urged by pressure springs toward a closed position, said springs and contacts being mounted on an insulating contact-holder (26, 62) which is capable of displacement in sliding motion within said body in order to cause opening and closing of said switches and which is mechanically associated with said moving armature whilst the stationary contacts are rigidly fixed to said body,

a gas-tight protective casing (42) which is fixed on the body so as to contain the switches and is provided with insulation with respect to said switches,

resilient means (14, 79) capable of placing said moving armature (15, 75) in a rest position in which said armature is located at a distance from said yoke (7, 76), wherein the contact-studs (30, 31, 32, 33) of the switches (36) are made of cuprous material whilst the protective casing (42) is filled with a non-oxidizing medium and sealed by sealing means (23, 55, 69, 47) which are placed on the one hand between the moving armature (15, 75) and a first face (21, 72) of the body (2, 65) and on the other hand between the protective casing (42) and a second face (41) of the body which is opposite to the first face.

4,638,276

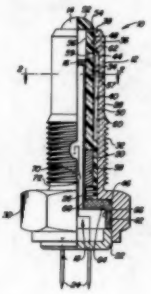
REED SWITCH WITH A HOUSING AND A PULSE GENERATOR

Klaus Hauk, Altrip, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Apr. 26, 1985, Ser. No. 727,654

Int. Cl.[4] H01H *1/66, 51/00*

U.S. Cl. 335—151 **1 Claim**



1. A reed switch comprising:

a hollow cylindrical housing having an axial bore therein with larger and smaller diameter bore portions;

a switch element supported within the housing;

a hollow cylindrical magnet carrier movable in the housing and having larger and smaller outer diameter sections, the larger section slidably engaging a wall of the larger bore portion of the housing, the smaller section slidably and sealingly engaging a wall of the smaller bore portion of the housing, the carrier including a blind bore extending therein for slidably receiving the switch element, the carrier and the switch element cooperating to define a variable volume chamber therebetween within the carrier at one end thereof, the larger diameter section of the carrier having a plurality of peripherally spaced apart, axially extending grooves in an outer surface thereof, the carrier having a first passage extending therethrough from the chamber to an outer surface of its smaller diameter section, the carrier having a second passage extending therethrough from the chamber to one of the grooves in the larger diameter section, the carrier being movable in the housing between an inner and an outer position therein, the resilient means urging the carrier to its outer position.

4,638,277

CIRCUIT BREAKER WITH BLOW OPEN LATCH

Glenn R. Thomas, Brighton Twp., Beaver County, and Jere L. McKee, Scott Twp., Lawrence County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 1, 1985, Ser. No. 782,669

Int. Cl.[4] H01H *3/00*

U.S. Cl. 335—190 **4 Claims**

1. A circuit breaker with blow open contact arm, comprising:

a circuit breaker unit having a pair of separable contacts operable between open and closed positions and including a releasable member;

the contacts sustaining a repulsion magnetic force which force is proportional to the square of the current load flowing through the contacts and which is operable to separate the contacts upon the occurrence of a predetermined current overload;

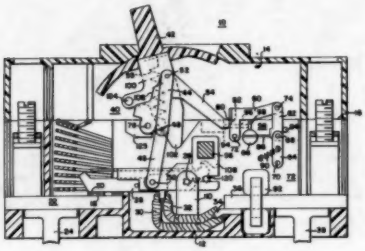
a trip mechanism movable in respone to the occurrence of a predetermined electric current overload to release the releasable member;

the circuit breaker unit including a contact arm carrying one of the contacts;

mounting means mounting the contact arm for pivotal movement upon actuation of the trip mechanism;

the mounting means including one of a cam and cam follower means for retaining the contact arm in either open or closed positions;

the contact arm including the other of the cam and cam follower means;



the cam follower means moves from a first cam position to a second cam position when the contact arm is propelled to the open contact position in response to a repulsion magnetic force occurring when the current exceeds the predetermined value;

the trip mechanism actuating the circuit breaker unit to the open contact position causing the mounting means to rotate and causing the cam follower means to move to the second cam position from the first cam position;

the cam follower means comprising a cam follower and spring means for holding the cam follower against the cam;

the assembly of the cam and cam follower means is disposed on the side of the pivot opposite the contact;

the cam is on the contact arm and the cam follower means is on the mounting means; and

the cam follower means comprising a pin slidable in slot means, said slot means being provided in the mouting means and a coil spring connected to the cam follower means for holding the pin against the cam.

4,638,278

MAGNETIC DETECTOR APPARATUS

Mark E. Bullock, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 14, 1986, Ser. No. 819,167
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—207 **19 Claims**

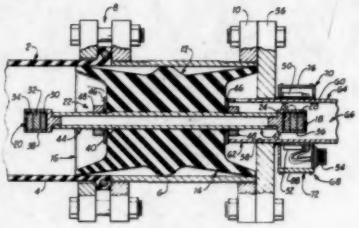
1. An apparatus for detecting a location of a movable member in a conduit, comprising:

a magnet connected to the movable member so that said magnet moves with the movable member inside the conduit;

a magnetically responsive switch means, connected to the outside of the conduit, for changing switch states when said magnet moves to an internal location of the conduit where the magnetic flux of said magnet actuates said switch means;

an end member attached to the conduit, said end member having an aperture defined therethrough;

a stop member extending through said aperture so that a first portion extends beyond one side of the end member into



the conduit and so that a second portion extends beyond another side of the end member outside the conduit, said first portion engaging the movable member when the movable member reaches a predetermined location in the conduit; and

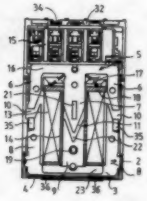
attachment means for attaching said switch means to said second portion of said stop member.

4,638,279

NOISELESS ELECTROMAGNET AND A CONTACTOR USING SUCH AN ELECTROMAGNET

Alain Brisson, and Jean R. Clément, both of Poitiers, France, assignors to La Telemecanique Electrique, France

Filed Jul. 19, 1985, Ser. No. 756,618
Int. Cl.[4] H01F *3/00, 7/08*
U.S. Cl. 335—257 **5 Claims**



1. An electromagnet with DC supply which comprises a fixed magnetic circuit having an E shape including a first web, a first central leg having a first end face and two first side legs which comprise two respective outer faces each having a chamfered portion and a stud bearing a damper element made from an amagnetic material, which serves as working position stop of the electromagnet, and a mobile magnetic circuit movable in translation, said mobile magnetic circuit having an E shape including a second web, a second central leg having a second end face and two second side legs which comprise two respective inner faces each having a chamfered portion and an end surface which comes to bear on said damper element in the working position, said second central leg being aligned and disposed with said second end face facing said first end face so as to form a central air gap, and said two second side legs being respectively aligned with said two first side legs with said chamfered portions and said end surfaces of the second side legs facing respectively the chamfered portions and the studs of the two first side legs to form between said chamfered portions two lateral air gaps oblique with respect to each other

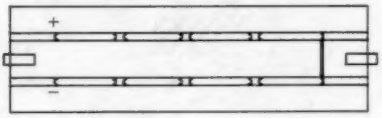
and between said end surfaces and said studs two small end air gaps.

4,638,280

MULTIPOLAR MAGNETIZING DEVICE PROVIDED WITH COOLING MEANS

Dietrich Steingroever, 5060, Berg.-Gladbach, and Erich Steingroever, Flensburger Str. 33, 5300 Bonn 1, both of Fed. Rep. of Germany

Filed Oct. 29, 1985, Ser. No. 778,207
Int. Cl.[4] H01F *13/00*
U.S. Cl. 335—284 10 Claims



1. In a multipolar magnetizing device for generating magnetic poles of alternating polarity in a permanent magnet body, of the type which includes a supporting plate of electrically insulating material provided with a surface to closely conform with the surface of said magnet body and an electrically conductive circuit array recessed in said insulating plate to generate selected magnetic poles in said magnet body when supported by the plate:

said conductive array including a plurality of series-connected magnetizing sections each comprising a single wire or rod, of low-resistance electrically conductive material arranged to define said magnetic poles to be generated in the magent body when energized by a unidirectional high-intensity electrical current, and;

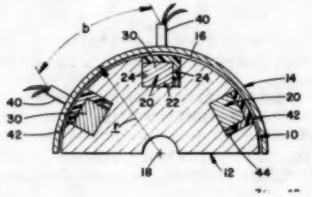
a plurality of cooling sections each additional lengths of said wire, or rod, joining respective adjacent ends of said magnetizing sections and shaped to resemble a closely wound double helix disposed remotely with respect to said magnet body.

4,638,281

MAGNETIC ROLL FOR COPY MACHINES AND METHOD FOR MANUFACTURING SAME

Horst Baermann, Rosrath-Rambrucken, Fed. Rep. of Germany, assignor to Max Baermann, G.m.b.H., Gladbach, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,637
Claims priority, application European Pat. Off., Nov. 26, 1984, 84114262
Int. Cl.[4] H01F *3/00*
U.S. Cl. 335—303 30 Claims



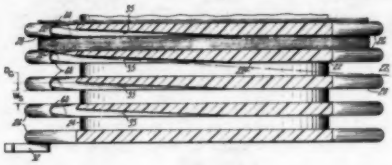
1. A magnetic roll for electro-photographic copying machines, comprising: a carrier having a longitudinal axis; a circumferentially spaced series of elongated permanent magnetic components extending axially on said carrier; said magnetic components having radially outwardly extending flux fields; and, means for selectively and independently rigidly positioning each magnet radially and circumferentially relative to said carrier so that the induction of each magnetic pole cooperates with the induction at neighboring poles to provide a predetermined magnetic field extending radially outwardly from said roll.

4,638,282

WIRE CROSS-OVER ARRANGEMENT FOR COIL ASSEMBLY

Donald E. Ellison, St. Clair Shores, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Jul. 18, 1985, Ser. No. 756,463
Int. Cl.[4] H01F *27/30*
U.S. Cl. 336—185 6 Claims



1. In a coil assembly including a bobbin and a multi-turn winding of coil wire disposed on the bobbin, the bobbin including a central spindle and a plurality of axially-spaced annular flanges extending from the spindle to define a plurality of respective slots between the axially-inner surfaces of adjacent pairs of said flanges and the winding being disposed in multiple layers in the respective said slots on the bobbin and being continuous between successive said slots in which it is disposed, the improvement wherein:

one flange of each pair of said flanges between which the winding is disposed including a cross-over groove formed in the axially inner surface thereof for receiving the coil wire which transitions from one said slot to another, said cross-over groove extending from a position near the radially-outer edge of the respective said flange in an inward direction substantially tangent to and to a position of substantial tangential coincidence with said bobbin spindle, the width and depth of said groove in the respective said flange being such as to receive the full diameter of the coil wire therewithin throughout the extent of said groove while also preserving the separating function of the flange, thereby to minimize or prevent contact of the coil wire transitioning into a slot with the radially outward windings in the respective slot and with the radially inward windings in the slot from which it is transitioning, and wherein the axial thickness of a said flange is greater than the axial width of a said slot, the diameter of the coil wire is many times less than said axial width of a respective said slot, said cross-over groove is directly axially open to said slot, and the depth of a said cross-over groove for a respective said slot at least near its outer end relative to the bobbin spindle is substantially as great as the axial width of the respective said slot such that the coil wire necessarily lies within said groove for substantially the full length of said groove.

4,638,283

EXOTHERMICALLY ASSISTED ELECTRIC FUSE

Gerhard Frind, Altamont; James J. Carroll, Clifton Park, both of N.Y.; John H. Van Noy, Pittsburgh, Pa.; John G. Leach, and Radha K. Ranjan, both of Hickory, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,711
Int. Cl.[4] H01H *85/04*
U.S. Cl. 337—162 19 Claims

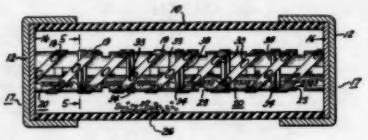
1. An exothermically assisted electric fuse comprising:

a pair of spaced-apart electrically conductive terminals;

a fusible conductive element connected between said terminals;

an exothermic body disposed adjacent to said fusible element, said exothermic body formed from material which exothermically reacts when heated to a predetermined temperature;

a triggering circuit connected between said terminals independently of said fusible element for initiating an exothermic reaction in said exothermic body in response to a disruption of said fusible element;



a containment body partially enclosing said exothermic body so as to confine the heat energy resulting from said exothermic reaction and to direct said heat energy in a predetermined direction; and

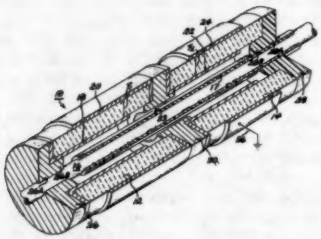
means for supporting said fusible element, said triggering circuit, and said containment body such that said exothermic body is in heat transfer relationship with both said fusible element and said triggering circuit so that upon disruption of said fusible element said heat energy generated by said exothermic reaction is directed by said containment body at said fusible element for causing additional disruptions therein.

4,638,284

TUBULAR VARISTOR ARRANGEMENT

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Corp., Schenectady, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,726
Int. Cl.[4] H01C 7/10
U.S. Cl. 338—21 **5 Claims**



1. A tubular varistor arrangement, comprising:

(a) first and second generally tubular varistor sections, aligned with each other;

(b) a center conductor disposed, generally concentrically, within said first and second varistor sections;

(c) first and second generally tubular electrodes respectively adjoining the radially inner and the radially outer surfaces of said first varistor section; and

(d) third and fourth generally tubular electrodes respectively adjoining the radially inner and radially outer surfaces of said second varistor section;

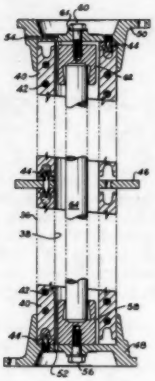
(e) said first tubular electrode being electrically shorted to said center conductor, said second tubular electrode being electrically shorted to said third tubular electrode, and said fourth tubular electrode being electrically shorted to a reference potential conductor, whereby the varistor breakdown voltage between said center conductor and said reference potential conductor constitutes the cumulation of breakdown voltages of said first and second varistor sections.

4,638,285

SURGE SUPPRESSING RESISTOR FOR A DISCONNECT SWITCH

Donald L. Lott, Portland, Oreg., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Feb. 28, 1985, Ser. No. 706,715
Int. Cl.[4] H01C 7/10
U.S. Cl. 338—21 **2 Claims**



1. A surge resistor, comprising:

at least first and second hollow, thermally conductive, electrically resistive bodies, each having an exterior surface and an interior surface for transferring heat from said body, said bodies being aligned along a common longitudinal axis;

a center flange positioned between the first and second resistor bodies;

a first end flange associated with the end of the first resistor body opposite the center flange;

a second end flange associated with the end of the second resistor body opposite the center flange; and

an electrically insulative stacking rod positioned along the longitudinal axis inside the first and second resistor bodies and extending between the first and second end flanges and releasably connected thereto forming a unitary structure wherein the end flanges, center flange and resistor bodies are electrically connected.

4,638,286

REACTIVE GAS SENSOR

Leo F. Nichols, Omaha, Nebr., assignor to Enron Corp., Houston, Tex.

Filed Mar. 26, 1985, Ser. No. 716,183
Int. Cl.[4] H01L 7/00; H01B 1/00
U.S. Cl. 338—34 **8 Claims**

1. A reactive gas sensor which comprises:

(a) an electrically conductive polymer composite comprising:

(i) an inner layer of an electrically conductive polymer selected from the group consisting of polyacetylene, poly(phenylene), poly(phenylene sulfide) and poly(phenylene oxide),

(ii) intermediate layers of a polymer which exhibits a low degree of gas permeability, and

(iii) protective outer layers of a polymer which exhibits a low degree of moisture permeability, and

(b) means for measuring the resistance of the electrically conductive polymer.

5. An electrically conductive polymer composite which comprises:

(a) an inner layer of an electrically conductive polymer selected from the group consisting of polyacetylene, poly(phenylene), poly(phenylene sulfide) and poly(phenylene oxide),

(b) intermediate layers of a polymer which exhibits a low degree of gas permeability, and

(c) protective outer layers of a polymer which exhibits a low degree of moisture permeability.

4,638,287

VEHICLE-LOADED DISPLAY DEVICE

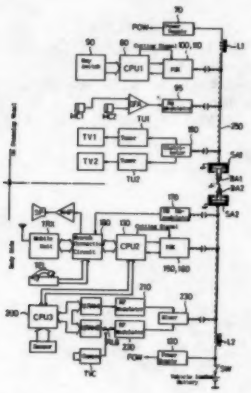
Kazuyuki Umebayashi, and Takahiro Yamada, both of Ikenohata, Japan, assignors to Aisin Seiki Kabushikikaisha, Aichi, Japan

Filed Jan. 10, 1984, Ser. No. 569,682

Claims priority, application Japan, Mar. 1, 1983, 58-34263; Mar. 1, 1983, 58-34264

Int. Cl.[4] G08G *1/00*

U.S. Cl. 340—22 **6 Claims**



1. A vehicle-loaded display device mounted on a vehicle having a steering wheel, said device comprising:

transmission line means, including an electric conductor;

a control board disposed at a central portion of said steering wheel;

a supporting mechanism for supporting said control board in a stationary condition irrespective of turning of said steering wheel;

at least one two-dimensional display means incorporated in said control board;

electric filter means, incorporated in said control board, for transmitting a first electric signal having a frequency, within a desired frequency range, through said transmitting means;

a first demodulation means incorporated in said control board for demodulating the first electric signal, received from said electric filter means, into display information and then applying the display information to said two-dimensional display means;

a plurality of command switches incorporated in said control board;

a first modulation means incorporated in said control board for FSK modulating a predetermined input code signal and for outputting a second electric signal through said transmission line means;

a first electronic control device incorporated in said control board to be connected with said command switches and said first modulation means for generating said code signal in accordance with operation of said command switches and then applying the code signal to said first modulation means;

a second modulation means disposed on a vehicle body in a position mechanically separated from said steering wheel for modulating an information signal into the first electric signal having a frequency different from and an amplitude much less than that of said second electric signal output by said first modulation means and then applying the first electric signal to said first demodulation means;

a display information generating means for generating said display information and then applying the display information to said second modulation means;

a second demodulation means, including a Schmitt trigger, disposed on the vehicle body in a position mechanically separated from said steering wheel, for demodulating said second electric signal into said code signal;

a second electronic control device disposed on the vehicle body in a position mechanically separated from said steering wheel and electrically connected to said second demodulation means for instructing said display information generating means to generate the display information in accordance with said code signal; and

an electric interconnection means, disposed beneath said steering wheel, said electric interconnection means comprising direct current blocking means for electrically connecting said first demodulation means and said first modulation means to said second modulation means and said second demodulation means, respectively, alternating current blocking means for electrically connecting a power supply line of said control board to a vehicle-loaded power supply, and said transmission line means,

whereby said first and second electric signals having different amplitudes and frequencies, and said code signal which is FSK modulated, all may be transmitted over said transmission line means.

4,638,288

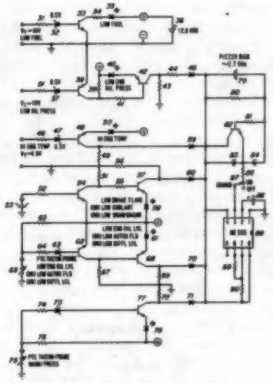
THERMAL LEVEL DETECTOR FOR CONDUCTIVE OR NONCONDUCTIVE LIQUIDS OR GASES

Matthew J. Remec, 2337 S. Fifth Ave., North Riverside, Ill. 60546

Filed Mar. 22, 1982, Ser. No. 197,005

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—52 F **15 Claims**



1. A monitoring system comprising:

a thermistor (13) having a turnover temperature, said thermistor assuming a predetermined resistance when the tem-

perature of said thermistor is above said turnover temperature;

means (15) for thermally coupling said thermistor to a liquid in a vessel when the level of said liquid is above a predetermined level, said liquid lowering the temperature of said thermistor below said turnover temperature when thermally coupled thereto;

means (10) for thermally insulating said coupling means from said vessel;

a tone generator (45, 59, 60, 70, 71, 79–90) for sounding a plurality of warning signals;

a warning circuit (9, 11, 12, 14, 15) directly connected to said thermistor and electrically isolated from said liquid for generating one of said warning signals indicating that the level of said liquid is below said predetermined level when said thermistor assumes said predetermined resistance; and

an annunciator (61–65, 67–69) for displaying said one warning signal.

4,638,289

ACCIDENT DATA RECORDER

Edmund Zottnik, Gerlingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

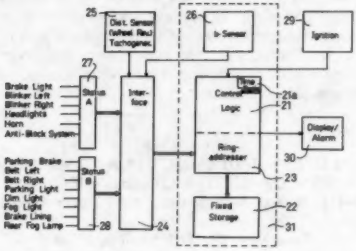
PCT No. PCT/DE84/00041, § 371 Date Oct. 23, 1984, § 102(e) Date Oct. 23, 1984, PCT Pub. No. WO84/03359, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 24, 1984, Ser. No. 676,193

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306814; Feb. 17, 1984, 3405757

Int. Cl.[4] B60Q *11/00;* **G01P** *15/125;* **G06F** *15/50*

U.S. Cl. 340—52 H **14 Claims**



1. A method of recording and storing vehicle data representing events and conditions relating to an accident of a motor vehicle having wheels that normally revolve with longitudinal travel of the vehicle and which is subjected to at least one of longitudinal, transverse and rotational acceleration during an accident, comprising:

generating a wheel revolution signal corresponding to revolutions of a wheel of the vehicle;

providing an acceleration sensor having at least three cantilever mounted tongues each acting as a movable plate of a capacitor, and a fixed capacitor plate for each tongue which is fixed with respect to the vehicle, two of said tongues lying in a common plane transverse to the direction of longitudinal travel of the vehicle, and the remaining tongue lying in a plane extending in the direction of longitudinal travel, said movable plates being movable toward and away from said fixed plates when the vehicle is subjected to longitudinal, transverse and rotational accelerations to change capacitance between said fixed and movable plates, said sensor including an oscillator circuit for each set of fixed and movable plates which produces frequency variation with a capacitance for each set of fixed and movable plates, said frequency variations comprising acceleration signals which are indicative of longitudinal, transverse and rotational accelerations of the vehicle;

generating a plurality of additional data signals corresponding to additional conditions of the vehicle;

continuously generating central timing pulses indicative of the absolute passage of time;

subjecting said revolution signal and said acceleration signals to an analog-to-digital conversion to form digital revolution data and digital acceleration data corresponding to the revolution and acceleration signals;

writing the digital revolution data, the acceleration data and the additional data signals into a sequence of data storing locations of a fixed storage at intervals timed by the central timing pulses, the locations being disposed in a primary storage loop having a beginning and an end, with the data being stored in sequential locations from the beginning to the end of the primary loop and then back into the beginning of the primary loop;

generating a trigger event when an accident occurs; and

after the occurrence of the trigger event, writing additional revolution data, acceleration data and data signals which occur after the trigger event, into a secondary loop of storage locations having a new starting address in the fixed storage so that data remains stored in the primary loop and additional data after the trigger event becomes stored in the secondary loop.

4,638,290

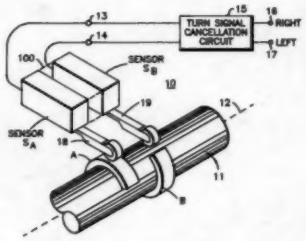
ELECTRONIC TURN SIGNAL CANCELLATION APPARATUS

David J. Wagner, Lake Zurich, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1985, Ser. No. 736,874

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—56 **15 Claims**



1. An electronic turn signal cancellation apparatus comprising:

a shaft rotatable about an axis and rotated in accordance with the rotation of a vehicle steering wheel;

first and second means fixed to said shaft and rotatable therewith, said first and second means positioned at ditferent relative angular positions about said shaft axis with respect to each other and axially spaced apart from each other;

first and second sensor means located separate from and about said shaft and positioned axially spaced apart from each other and at fixed angular positions with respect to said shaft axis;

said first sensor means associated with and positioned for sensing the rotation of said first means about said axis and providing a first sensor output signal in accordance therewith, said first output signal being unresponsive to the rotation of said second means, and said second sensor means being associated with and positioned for sensing the rotation of said second means about said axis and providing, in response thereto, a second sensor output signal independent of said first output signal, said second output signal being unresponsive to the rotation of said first means, each of said first and second output signals, respectively, related to the rotational positions of said first and second means about said axis; and

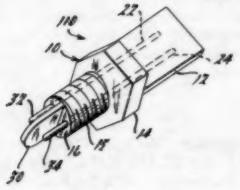
means for receiving said first and second output signals and providing separate right/left turn signal cancellation signals in accordance therewith.

4,638,291

SENSOR ASSEMBLY FOR A RADIATOR MOUNTED COOLANT LEVEL MONITORING SYSTEM

Boris Puscasu, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 13, 1984, Ser. No. 620,298
Int. Cl.[4] B60Q *1/00*; G01F *23/00*
U.S. Cl. 340—59 **6 Claims**



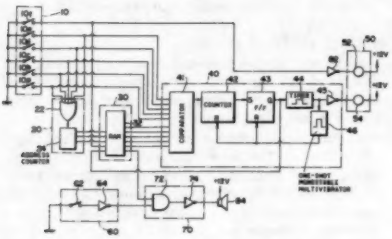
1. An electrically conductive liquid level sensor comprising, a pair of identical and parallelly spaced electrically conducting probes of equal length exposed along their lengths for contact by said liquid, an electrical insulator partition extending between and beyond the length of said probes so as to interrupt any direct conduction path therebetween, said probes are configured for connection to a source of electrical potential, whereby an electrically conductive path is established between said probes around said insulator partition only when said probes are immersed in said conductive liquid.

4,638,292

THEFT PREVENTION SYSTEM IN AN AUTOMOTIVE KEYLESS ENTRY SYSTEM WITH AUTOMATIC DOOR LOCKING

Haruo Mochida, and Hirotoshi Namazue, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited and Kokusan Kinzoku Kogyo, both of, Japan

Filed Aug. 24, 1982, Ser. No. 411,096
Claims priority, application Japan, Aug. 26, 1981, 56-132565
Int. Cl.[4] B60R *25/00*; G06F *7/04*
U.S. Cl. 340—63 **9 Claims**



1. A theft prevention system in an automotive keyless entry system comprising:

a vehicle door-lock mechanism:

an actuator associated with said door-lock mechanism to operate the door-lock mechanism to a first, door-locked, position and to a second, door-unlocked, position;

an input unit including a plurality of push buttons respectively representing preset values;

first means, comprising a preselected door locking push button in said input unit, for operating said actuator to operate said door lock-mechanism to said first position when said door locking push button is depressed;

second means for operating said actuator to operate said door-lock mechanism to said second position;

third means, associated with said first and second means, for continuously producing a first signal when said actuator is operated to maintain said door-lock mechanism at said first position in response to depression of said door locking push button, said third means being responsive to operation of said first means to produce said first signal and being responsive to operation of said second means to stop producing said first signal;

fourth means for producing a second signal in response to opening of the vehicle door; and

fifth means for producing a theft preventive alarm upon simultaneous occurrence of both of said first and second signals.

4,638,293

BURGLAR ALARM BUILT IN CAR STEREO

Byung-Woo Min, 970 S. Kingsley Dr. #310, Los Angeles, Calif. 90006

Filed Aug. 20, 1984, Ser. No. 642,431
Int. Cl.[4] B60R *25/00*
U.S. Cl. 340—63 **19 Claims**

1. A car alarm system comprising:

(a) a radio/tape player device within the car including speakers for generating audio sounds, an electronic control circuit and a plurality of function selector switches;

(b) alarm circuit means for sensing alarm conditions within said car and generating alarm signals in response thereto, said alarm circuit means being programmable by said function selector switches;

(c) mode selection circuit means for operatively interfacing said electronic control circuit and said function selector switches in a normal mode, and operatively interfacing said alarm circuit means and said function selector switches in an alarm mode, said mode selection circuit means being responsive to coded signals generated by the actuation of predetermined ones of said function selector switches to change between the normal and alarm modes; and

(d) disarming means for said alarm circuit means including,

1. input circuit means for inputting multi-bit disarming codes generated by sequential actuation of a plurality of said function selector switches,

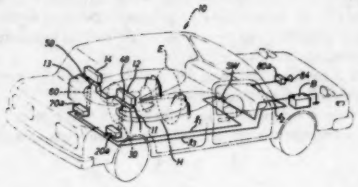
2. memory means for storing multi-bit codes input by said plurality of said function selector switches during a programming mode of said disarming means; and

3. equality detector means for determining when a multi-bit code input by the sequential action of said plurality of function selector switches equals the multi-bit code stored in said memory means, and when equal, generating a disarm signal to said alarm circuit means to change said system to said normal mode.

4,638,294
UNAUTHORIZED ENTRY DETECTION SYSTEM

Takashi Sakurai, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 23, 1984, Ser. No. 633,443
Claims priority, application Japan, Jul. 25, 1983, 58-135486
Int. Cl.[4] B60R *25/00*; G08B *13/18*
U.S. Cl. 340—63 **11 Claims**



1. An unauthorized entry detection system for an automotive vehicle having a passenger compartment of a given size, comprising:

oscillator means, adapted to be disposed in said vehicle, for generating an oscillation signal having a predetermined frequency corresponding to said passenger compartment size;

first antenna means, adapted to be disposed within said passenger compartment and coupled to said oscillator means, for generating an electromagnetic wave inside said passenger compartment to cause said passenger compartment to resonate as a cavity resonator at said predetermined frequency, said electromagnetic wave corresponding to said oscillation signal;

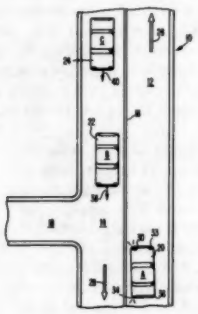
second antenna means, adapted to be disposed in said passenger compartment, for generating an induced voltage in response to a magnetic component of said electromagnetic wave; and

detecting means, coupled to said second antenna means, for detecting a change in said induced voltage and providing a detection signal corresponding to said change.

4,638,295
VEHICULAR MOVEMENT INDICATOR SAFETY SYSTEM

Robert B. Middlebrook, 47 Hemlock Cir., Princeton, N.J. 08540, and W. Bard Turner, 7 Bryant Rd., Lexington, Mass. 02173

Filed May 7, 1984, Ser. No. 607,954
Int. Cl.[4] B60Q *1/34*
U.S. Cl. 340—73 **2 Claims**



1. A turn signal apparatus for use on a motor vehicle comprising:

turn signal lamp means with a predetermined flashrate;

automobile turn indicator switch means;

front wheel directional sensor means for sensing when at least one of the front wheels of said vehicle is turned;

vehicle motion commitment sensor means for sensing the commitment of said vehicle to motion;

vehicle speed detection means for detecting when the speed of said motor vehicle exceeds a predetermined speed;

brake sensor means for sensing when the brakes of said vehicle are applied;

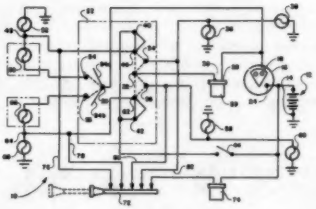
microprocessor means connected to said automobile turn indicator switch means, said front wheel directional sensor means, said vehicle motion commitment sensor means, said brake sensor means, and said vehicle speed detection means for determining when said motor vehicle is unambiguously committed to executing a turn; and,

signal lamp timing means for increasing the flash rate of said predetermined flash rate in response to said microprocessor means.

4,638,296
DIRECTIONAL SIGNAL SWITCH AND ALTERNATING LIGHTING OF REAR LAMPS

William A. Heidman, Jr., 4604 Robbins, San Diego, Calif. 92122

Continuation-in-part of Ser. No. 139,789, Apr. 14, 1980, Pat. No. 4,354,174. This application Jun. 11, 1982, Ser. No. 387,457
Int. Cl.[4] B60Q *1/46*
U.S. Cl. 340—83 **12 Claims**



1. A turn signal switching circuit for an automotive vehicle, said vehicle having an ignition switch with an output terminal, first and second turn signal and brake lamp circuits each having at least one front turn signal lamp, rear turn signal and brake lamp on opposite sides of said vehicle, each of said lamps have first and second element connections comprising:

a flasher element having an input connection connected to the output terminal of said ignition switch and an output connection;

a common electrical ground;

a battery having a positive and negative terminal, said positive terminal connected to the input terminal of said ignition switch and said negative terminal connected to said common electrical ground;

a turn signal switch interconnected between the first element connection of said front and rear turn signal lamps and brake lamps circuits and the output connection of said flasher element for selectively connecting one of said turn signals and brake lamp circuits to the output connection of said flasher element;

switching means mechanically interconnected to said turn signal switch for operation therewith and electrically interconnected between the output terminal of said ignition switch and the second terminal of the rear turn signal lamp on each side of said vehicle; and

said second element connection of said brake lamp and front turn signal lamp on each side of said vehicle is connected to said common electrical ground,

said turn signal switch and mechanically interconnected switching means acting, when operated for lamp illumination on a selected side of said vehicle to illuminate said rear turn signal lamp alternately with illumination of said

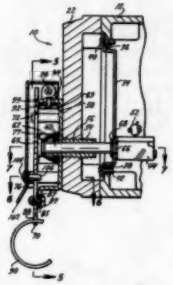
brake, and front turn signal lamps on said selected side of said vehicle.

4,638,297

REMOTE SIGNALING BOX

Rolland R. Roots, St. Louis, Mo., assignor to Killark Electric Manufacturing Company, St. Louis, Mo.

Filed Aug. 20, 1984, Ser. No. 642,442
Int. Cl.[4] G08B *25/00*; H01H *27/10*
U.S. Cl. 340—304 **20 Claims**



1. A remote control assembly for a signaling box of the kind defined by an enclosure including a cover plate and having a switch located within the enclosure and operable by a spring-loaded push button mounted on the switch, comprising:

a door,

means for mounting the door on the cover plate for pivotal movement of the door between a closed position and an open position,

means for preventing operation of the switch, said means being affixed to the door so that when the door is closed, the switch is prevented from operating and when the door is open, the switch can be operated, and means for remote activation of the spring-loaded push button comprising a plunger, means to mount the plunger so that it extends through the cover plate in alignment with the push button and is slidable between first and second positions, whereby the plunger depresses the push button in the first position of the plunger and releases the push button in the second position of the plunger, the means for preventing operation of the switch comprising a barrier for blocking movement of the plunger to the second position when the door is closed.

4,638,298

COMMUNICATION SYSTEM HAVING MESSAGE REPEATING TERMINALS

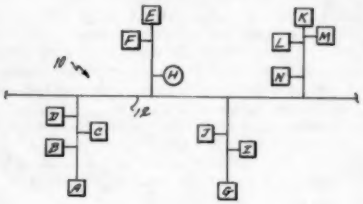
Jan L. Spiro, Santa Clara, Calif., assignor to Telautograph Corporation, Los Angeles, Calif.

Filed Jul. 16, 1985, Ser. No. 756,097
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—827 **37 Claims**

1. A system for communicating on a single bus formed by a power distribution network, said system comprising a plurality of units joinable to the network, including at least three terminal units, each terminal unit being connectable directly with at least one external communication device, such as an input or output device, and having when connectable to an input device, means responsive to a message received therefrom for generating a message to be received by another terminal unit, and when connectable to an output device, means responsive to a message received from another terminal unit for transmitting the message to the output device, at least a first one of said terminal units further comprising:

means for receiving on the network a message transmitted from a second terminal unit;

means for determining whether the message is intended for a third terminal unit; and



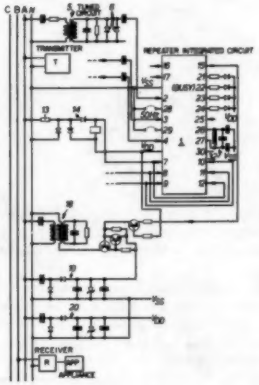
means for retransmitting on the network such a message intended for a third terminal unit.

4,638,299

ELECTRICAL APPLIANCE CONTROL

David C. Campbell, Fife, Scotland, assignor to Pico Electronics Limited, Fife, Scotland

Filed Mar. 28, 1983, Ser. No. 479,397
Claims priority, application United Kingdom, Apr. 6, 1982, 8210198
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—310 A **10 Claims**



1. A repeater circuit for repeating a digital control message transmitted on an electical multi-phase power main system, the message including a sequence of digital words with the words transmitted in respective time intervals spaced apart by intermediate time intervals which are at least as long as said respective time intervals, and each word conveyed by a phase of the main system having bits transmitted in synchronism with the voltage zero-crossings of that phase, said multi-phase power main system including a first section from which said words are to be received and a second section onto which said words are to be repeated, the repeater circuit comprising:

first zero-crossing detection means electrically coupled to said first multi-phase power main section to detect the moments substantially at which the voltages on the phases of said section pass through zero;

data input means working cooperatively with said first multi-phase power main section to receive therefrom the digital words conveyed by the phases of said section;

storage means coupled to said data input means and con-

trolled by said first zero-crossing means for storing the bits of a word received in said respective time intervals;

second zero-crossing detection means electrically coupled to said second multi-phase power main section to detect the moments substantially at which the voltages on the phases of said second section pass through zero;

time slot defining means working cooperatively with both detection means for defining, in dependence upon said moments detected by the detection means, output time slots synchronized with the phases of said second section for the transmission of the bits of said words in said intermediate time intervals; and

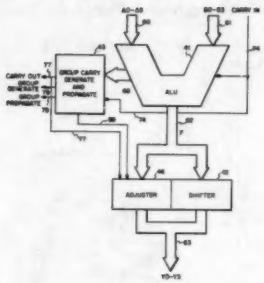
output means electrically connected to the storage means for conveying the bits of a word stored in the storage means onto the phases of said second section in the defined output time slots in said intermediate time intervals.

4,638,300

CENTRAL PROCESSING UNIT HAVING BUILT-IN BCD OPERATION

Michael J. Miller, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 10, 1982, Ser. No. 376,317
Int. Cl.[4] H03K *13/24*; G06F *5/006*
U.S. Cl. 340—347 DD **13 Claims**



1. In a circuit for converting binary digital signals into BCD digital signals by correcting and shifting said binary signals iteratively, an ALU for correcting said binary digital signals comprising:

recognition combinatorial logic means responsive to said binary digital signals for generating an enabling signal,

correction combinatorial logic means responsive to said enabling signal and said binary digital signals for generating correction signals,

half adder means responsive to said binary digital signals and said correction signals for generating corrected signals and

additional half adder and logic means responsive to said binary digital signals, said additional half adder and logic means generating true and complementary signals of said binary signals for said recognition logic means and said correction means, and true signals for said half adder means.

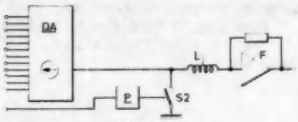
4,638,301

STRAY PULSE ELIMINATING DEVICE

Mats P. Akerlund, and Ture J. Strömbäck, both of Järfälla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,135
Claims priority, application Sweden, Aug. 5, 1983, 8304290
Int. Cl.[4] H03K *5/159*
U.S. Cl. 340—347 CC **5 Claims**

1. A device for eliminating stray pulses occurring at the output of a digital-to-analogue converter by preventing said stray pulses from reaching a connected circuit for a time period during which the pulse is predicted to occur, wherein said device comprises an inductor serially connected between the output of the digital-to-analogue converter and the connected circuit and a switch connected between the output of the



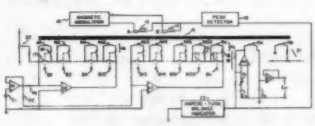
digital-to-analogue converter and a reference level, and means for operating said switch to short-circuit the output of the digital-to-analogue converter to the reference level for the time period during which a stray pulse is predicted to occur.

4,638,302

DIGITAL-TO-ANALOG CONVERTER

Eddy So, and William J. M. Moore, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Aug. 15, 1985, Ser. No. 766,136
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA **3 Claims**



1. A converter for converting a series of digital input bits to an analog output, comprising

(a) magnetic core means,

(b) primary and secondary ratio windings coupled with the core means,

(c) the primary winding being divided into at least two sections,

(d) means for passing a first predetermined primary direct current through a first of said sections,

(e) means controlled by a first group of the more significant input bits for varying the number of turns of said first section traversed by the first current,

(f) means for passing a second predetermined primary direct current through a second of said sections,

(g) means controlled by a second group of less significant input bits for varying the number of turns of said second section traversed by the second current,

(h) means for passing a secondary direct current through the secondary winding, including means for varying said secondary current proportionally with the number of turns of the first primary section traversed by the first primary current,

(i) means coupled with the core means for detecting a net ampere-turns unbalance of the primary and secondary currents in said ratio windings,

(j) means controlled by said detecting means for further varying the secondary current to tend to bring said unbalance to zero, and

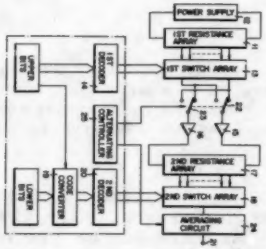
(k) an analog output proportional to the secondary current.

4,638,303

DIGITAL-ANALOG CONVERTER

Eiji Masuda, and Shigemi Sakamoto, both of Kawasaki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 528,972, Sep. 2, 1983, abandoned. This application Oct. 28, 1985, Ser. No. 792,181
Claims priority, application Japan, Jul. 9, 1982, 57-155521
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA 8 Claims



1. A digital analog converter, coupled to a reference voltage, for receiving a multi-bit digital signal and producing an analog value, said converter comprising:

a first resistor array consisting of a plurality of resistors connected in series to divide said reference voltage into M output voltages, where M is a positive integer;

a first switch array for receiving said output voltages of said first resistor array to select two adjacent ones of said output voltages in accordance with a first number of upper bits of said digital signal;

a first select switch for outputting one of said two adjacent output voltages selected by said first switch array;

a second select switch for outputting the other of said two adjacent output voltages selected by said first switch array;

two buffer amplifiers, coupled to said select switches, each receiving a different one of the two selected output voltages from said select switches in accordance with the states of said first and second select switches;

a second resistor array consisting of a plurality of resistors connected in series to receive said output voltages from said buffer amplifiers and divide said output voltages into N voltages, where N is a positive integer;

a second switch array for selecting one of said output voltages from said second resistor array in accordance with the contents of a second number of lower bits of said digital signal;

an averaging circuit including means for receiving the selected output voltage from the second switch array and obtaining an average of said selected output voltage; and

an alternating controller for synchronously controlling said select switches and said averaging circuit.

4,638,304

ENVIRONMENTAL ABNORMALITY DETECTING APPARATUS

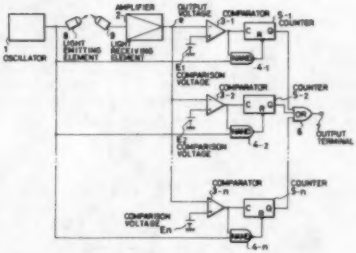
Tetsuo Kimura, Tokyo; Seiichi Tanaka, Chiba, and Takasi Suzuki, Tokyo, all of Japan, assignors to Nittan Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,768
Claims priority, application Japan, Dec. 13, 1983, 58-233692
Int. Cl.[4] G08B *23/00, 17/10*
U.S. Cl. 340—500 11 Claims

10. A system for detecting an environmental paramter, comprising the steps of:

means for detecting analog information representing changes in an environmental parameter and for converting the analog information to an electrical signal;

means for comparing a magnitude of the electrical signal to at least first and second reference levels and for providing respective first and second outputs given respective desired comparisons, the first reference level being different than the second reference level; and



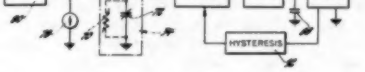
timing circuit means connected to receive the first and second outputs and for providing a control output after a predetermined time, said predetermined time having a first value in response to the first output and a second different value in response to the second output so that the predetermined time is dependent upon the magnitude of the detected analog information.

4,638,305

APPARATUS FOR DETECTING WATER IN FUEL

Stephen J. Sutton, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1985, Ser. No. 714,887
Int. Cl.[4] G08B *21/00;* H01H *29/00*
U.S. Cl. 340—620 3 Claims



1. Apparatus for detecting water in a fuel container wherein the fuel has a tendency to deposit an insulating coating on surfaces it contacts, comprising

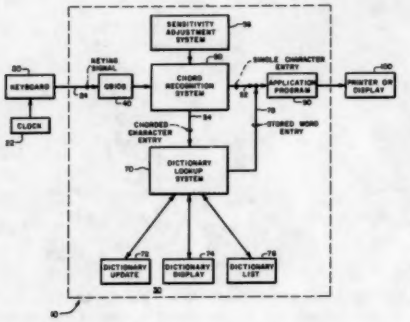
a conductive probe for location in a conductive fuel container at a level to contact water that may collect in the container, so that the probe when contacting the water in the absence of an insulating coating, will be resistively coupled to the container and when contacting the water while covered with an insulating coating will be capacitively coupled to the container, and

a detection circuit ccupled to the probe and having means responsive to low probe resistance or high probe capacitance for generating an output signal indicative of water contact with the probe.

4,638,306
KEYBOARD ENTRY SYSTEM

Philip Rollhaus, Chicago, Ill., and Yukio Endo, Thornton, N.H., assignors to Quixote Corporation, Chicago, Ill.

Filed Jan. 30, 1984, Ser. No. 574,894
Int. Cl.[4] G06F 3/02; G08C 9/00
U.S. Cl. 340—365 R 22 Claims



1. A keyboard entry system for a selected language, said system comprising:

a keyboard comprising a plurality of keys, said plurality of keys comprising a set of letter keys comprising a respective key for each letter of said selected language;

first means, responsive to the plurality of letter keys, for generating keying signals in response to activation of the letter keys, each keying singal characterized by a respective activation time;

second means, responsive to the first means, for generating output signals in response to the keying signals, said second means comprising:

means for classifying a plurality of keying signals as a key chord in the event the respective activation times satisfy predetermined criteria, said classifying means comprising;

means for setting a time threshold value prior to initiation of a typing session in said selected language;

means for comparing an elapsed time separating the activation times of a pair of the keying signals included in the plurality of keying signals with said time threshold value; and

means for designating said plurality of keying signals as a key chord in the event a selected one of the elapsed time and the time threshold value is greater than the other;

means for storing a list of stored texts, each corresponding to a respective chord;

means, responsive to the key chord for utilizing the keying signals associated with the key chord to select the one of the stored texts in the list of stored texts which correspond to the key chord;

means for setting the output signal to correspond to the selected one of the stored text and

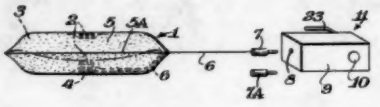
means for setting the output signal to correspond to the letters corresponding to the activated letter keys in the event the respective activation times fail to satisfy said criteria.

4,638,307
PATIENT POSITION MONITORING SYSTEM

Willson C. Swartout, 31 Phoenix Ave., Newark, Del. 19711

Filed Oct. 15, 1985, Ser. No. 787,102
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—666 8 Claims

1. Apparatus for issuing an alarm when a weight is lifted from a pad switch assembly, said apparatus comprising a compressible pad, a thin sealed reed switch affixed on one side of said pad, and a magnet affixed on the opposite side of said pad in approximate close parallel registry with said reed switch, said reed switch being connected in an electrical circuit containing a power source and an alarm issuing means such that when said pad is compressed by a weight causing said magnet

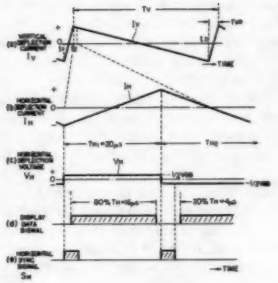


to be in closer proximity to said switch, the circuit is open and no alarm issues, but when said weight is lifted and said pad decompresses causing said magnet to move away from close proximity to said reed switch, the circuit closes and said alarm issues.

4,638,308
CRT PICTURE DISPLAY APPARATUS

Hiroshi Kuwabara, Hitachi; Jushi Ide, Mito; Yasuji Kamata, Hitachi, and Kenkichi Yamashita, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,390
Claims priority, application Japan, Sep. 28, 1983, 58-178041
Int. Cl.[4] G09G 1/08
U.S. Cl. 340—736 5 Claims



1. A CRT display apparatus for the raster scan type comprising:

a cathode ray tube for raster scanning;

a horizontal deflection circuit for supplying a horizontal deflection current to a horizontal deflection coil of said cathode ray tube;

a vertical deflection circuit for supplying a vertical deflection current to a vertical deflection coil of said cathode ray tube in synchronism with a vertical sync signal; and

display data generator means for supplying data to be displayed to said cathode ray tube,

said horizontal deflection circuit producing as said horizontal deflection current a triangular waveform current having one period which is twice a horizontal scanning period, said triangular waveform current having a series of triangular waveforms each having a first portion which increases in response to a horizontal sync signal at a predetermined inclination and a second portion which decreases in response to the next horizontal sync signal at said predetermined inclination and continues until the further next horizontal sync signal, whereby the period for a scanning line to proceed from lefthand end to righthand end of a raster on a screen of said cathode ray tune is made substantially equal to a period for the next scanning line to proceed from righthand end to lefthand end,

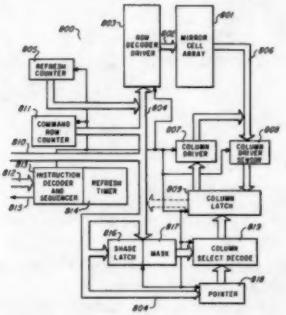
and wherein data is displayed during both of these periods, said horizontal deflection circuit including two voltage divider elements connected in seri s to a DC power supply, and a series connection of two switching elements connected in parallel with said two voltage divider elements, said horizontal deflection coil being connected between a junction of said two voltage divider elements and a junction of said two switching elements, and said two switching elements being responsive to the horizontal sync signal to be turned on alternately.

4,638,309

SPATIAL LIGHT MODULATOR DRIVE SYSTEM

Granville E. Ott, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 8, 1983, Ser. No. 530,329
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—752 **12 Claims**



1. A spatial light modulating device comprising:

a plurality of row conductors;

a plurality of column conductors arranged transversely to said plurality of row conductors and extending thereacross to define a plurality of intersections between respective row and column conductors;

a plurality of charge storage cells respectively disposed at each of the intersections of said row conductors and said column conductors, each charge storage cell having a light modulator cell associated therewith as so to collectively define a matrix array of charge storage cells and associated light modulator cells arranged in rows and columns, the light modulation of each of said light modulator cells corresponding to the charge stored in said associated charge storage cell;

row decode means connected to said row conductors for receiving a digital row signal and coupling a predetermined voltage to a selected one of said row conductors corresponding to said digital row signal, thereby selecting one of said rows;

column drive means connected to said column conductors for receiving a digital column signal of more than one bit for each column conductor and generating a column drive signal on each of said column conductors proportional to said corresponding digital column signal, thereby storing a charge corresponding to said column drive signal in the charge storage cells of said selected row;

column sensor means connected to said column conductors for sensing the charge stored in the charge storage cells of said selected row and generating a digital column signal of more than one bit for each column conductor;

column latch means connected to said column drive means and to said column sensor means for storing therein the digital column signals generated by said column sensor means and for applying the digital column signals stored therein to said column drive means;

a refresh counter connected to said row decode means for storing therein a digital row signal corresponding to one of said plurality of row conductors;

sequencing means connected to said row decode means, said refresh counter, said column drive means, said column sensor means and said column latch means for periodically enabling the following automatic refresh sequence:

(1) applying the digital row signal stored in said refresh counter to said row decode means for selecting a row conductor corresponding to said digital row signal;

(2) enabling said column sensor means to sense the charge stored in each charge storage cell in said selected row and generate a corresponding set of digital column signals;

(3) storing said digital column signals in said column latch means;

(4) applying said digital column signals stored in said column latch means to said column drive means, thereby causing said column drive means to store a charge in each charge storage cell in said selected row proportional to said corresponding digital column signal; and

(5) incrementing the digital row signal stored in said refresh counter to correspond to the next sequential row conductor;

command input means connected to said sequencing means for receiving a multibit command input; and

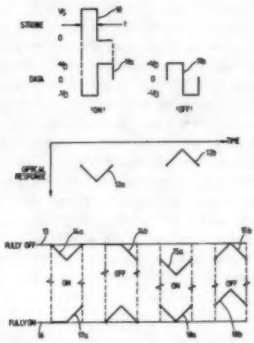
said sequencing means further including means for alternately enabling said automatic refresh sequence and enabling a command sequence corresponding to a received command input.

4,638,310

METHOD OF ADDRESSING LIQUID CRYSTAL DISPLAYS

Peter J. Ayliffe, Bishops Stortford, England, assignor to International Standard Electric Company, New York, N.Y.

Filed Sep. 6, 1984, Ser. No. 647,567
Claims priority, application United Kingdom, Sep. 10, 1983, 8324304
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—805 **14 Claims**



1. A method of addressing a matrix array type liquid crystal display device with a ferro-electric liquid crystal layer whose pixels are defined by the areas of overlay between the members of a first set of electrodes on one side of the liquid crystal layer and the members of a second set of electrodes on the other side of the layer, and whose pixels exhibit optical properties when selectively operated to fully on and fully off states, wherein strobing pulses are applied serially to the members of the first set while data pulses are applied in parallel to the second set in order to address the cell line by line, and wherein the waveform of a data pulse is balanced bipolar and at least twice the

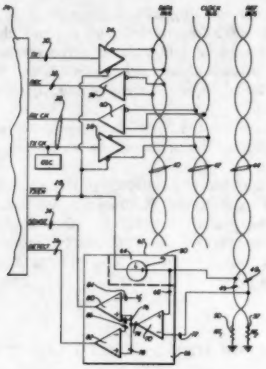
duration of a strobing pulse, and wherein the balanced bipolar data pulse when applied to a non-addressed pixel in other than a fully on state or fully off state restores such pixel to its original condition at the end of the data pulse.

4,638,311

APPARATUS FOR PROVIDING MASTERLESS COLLISION DETECTION

Eugene P. Gerety, Wolcott, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,701
Int. Cl.[4] H04H *1/00*
U.S. Cl. 340—825.06 **20 Claims**



1. An apparatus for providing masterless collision detection in a communication network having a plurality of nodes each being capable of transmitting data; said apparatus comprising:

a data transmission bus, said data transmission bus being common to all of said nodes;

a collision detection reference bus, said collision detection reference bus being common to all of said nodes and distinct from said data transmission bus;

means, associated with each said node, for injecting a current onto said collision detection reference bus;

means, associated with each said node, for monitoring the current on said collision detection reference bus, said monitoring means providing a signal indicative of said current said current monitoring means including a comparator having one input thereto connected to said collision detection reference bus and the other input connected to a preselected reference, said comparator generating a logic level signal only when at least two of said current injecting means are operative; and

means, associated with each said node and responsive to said signal, for providing a signal for controlling the injection of data onto said data transmission bus.

4,638,312

ORDER ENTRY SYSTEM INCLUDING AN INTERACTIVE MENU DISPLAY

Bruce A. Quinn, Beavercreek, and Scott N. Barton, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 25, 1985, Ser. No. 791,629
Int. Cl.[4] H04Q *7/00*; E04H *3/04*
U.S. Cl. 340—825.35 **13 Claims**

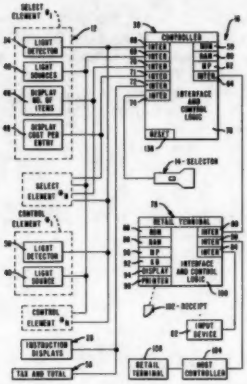
1. A data entry system comprising:

a display having data entry elements and control elements positioned on said display and lighting means to light up said data entry and control elements when selected; each said data entry element and control element having a detector associated therewith; said display also having a first display area for indicating parameters such as the number of units of said data entry elements selected;

an aiming selector having means for emitting first and second light signals directed at said data entry and control elements which are to be selected;

control means for controlling the operation of said data entry system;

said control means including means coupled to said detectors for producing first and second outputs in response to



said first light signals and said second light signals, respectively, falling on said detectors;

said first output being used by said control means and said lighting means to give a first indication that said aiming selector is directed to a particular one of said data entry or control elements, and said second output being used by said control means and said lighting means to give a second indication that said particular one of said data entry or control elements is selected for entry into said data entry system.

4,638,313

ADDRESSING FOR A MULTIPOINT COMMUNICATION SYSTEM FOR PATIENT MONITORING

Glen R. Sherwood, Jr., Hillsboro; James B. Moon, and Gordon A. Moyle, both of Portland, all of Oreg., assignors to Space-Labs, Inc., Chatsworth, Calif.

Filed Nov. 8, 1984, Ser. No. 669,289
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.52 **6 Claims**

1. A method of synchronizing to a multipoint communication system wherein a primary station repeatedly polls a plurality of secondary stations coupled together over a serial data bus comprising the steps of:

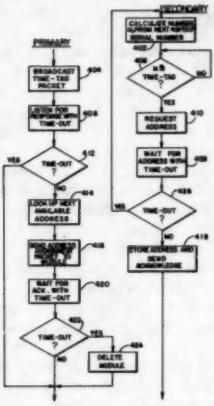
dynamically assigning an address to a new secondary station upon coupling to said system, said step of dynamically assigning further comprising the steps of:

broadcasting time-tags to all of said secondary stations simultaneously during an address initialization phase at the beginning of each poll interval;

automatically determining a first time-tag count number of poll intervals for each of said new secondary stations upon coupling to said system;

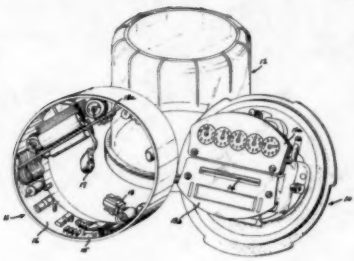
waiting said time-tag count number of poll intervals to choose a poll interval for requesting an address assign-

ment from said primary station during said address initialization phase of said chosen poll interval;
requesting said address assignment, and



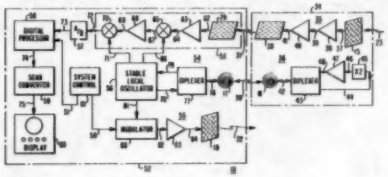
assigning an address to said secondary station in response to said request.

4,638,314
METER TRANSPONDER HYBRID
Franz Keller, Boston, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.
Filed Jan. 12, 1984, Ser. No. 570,118
Int. Cl.[4] G08C 9/06
U.S. Cl. 340—870.02 **5 Claims**



1. In an energy consumption measuring system of the type comprising a standard watt-hour meter consisting of a meter movement mounted within a standard enclosing cover, said meter movement being connected to power lines and having a metallic disc mounted for rotation at a rate related to the consumption by a consumer of energy supplied over the said power lines, a pulse initiator located within said standard meter cover and responsive to rotation of said disc for generating pulses indicative of the said energy consumption, and a transponder for effecting two-way communication between said watt-hour meter and a remote central location, said transponder including means for receiving signals transmitted from a remote central location over said power lines and means for transmitting metering information to said remote central location over said power lines, said transponder further including means responsive to said pulses generated by said pulse initiator for providing the metering information that is to be transmitted over said power lines upon receipt of a signal over said power lines from the remote central location, the improvement wherein said transponder comprises a circuit board of substantially annular configuration which is disposed externally of and in at least partially surrounding relation to said standard watt-hour meter movement within said standard cover of said meter, said transponder comprising a plurality of electrical components which are mounted on said annular circuit board in spaced relation to one another adjacent the exterior of the meter movement and within said standard meter cover, coupling means for connecting selected ones of said transponder electrical components to said pulse initiator, and further coupling means for connecting other selected ones of said transponder electrical components to said power lines, said transponder and each of said coupling means being located entirely within said standard cover.

4,638,315
ROTOR TIP SYNTHETIC APERTURE RADAR
Robert S. Raven, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 20, 1984, Ser. No. 622,516
Int. Cl.[4] G01S 13/90
U.S. Cl. 342—5 **11 Claims**



1. A rotor tip synthetic aperture radar comprising:
a rotor operable to rotate;
a first receiver positioned at a first location in said rotor for receiving target reflected microwave signals;
a transmitter positioned at a second location including means for generating and transmitting microwave signals towards a target;
said first receiver including means for amplifying said received microwave signals and for retransmitting said amplified microwave signals to a second receiver positioned at said second location;
said second receiver including means for extracting information from said amplified microwave signals;
first means for generating a pilot signal having a first predetermined frequency positioned at said second location and for transmitting said pilot signal to a second means positioned at said first location for receiving said pilot signal, multiplying its frequency and retransmitting said multiplied pilot signal to said second location;
third means at said second location for receiving and multiplying the frequency of said received pilot signal to provide a first signal;
fourth means for mixing said first signal with a second predetermined frequency to provide a second signal; and
fifth means for mixing said second signal with said amplified microwave signals received by said second receiver to cancel first order doppler frequency shifts of said amplified microwave signals in passing from said first location to said second location.

4,638,316
RADAR REFLECTING ELECTROLYTES
Theodore D. Austin, Landover, and John P. Consaga, Clinton, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 30, 1973, Ser. No. 408,973
Int. Cl.[4] G01S 7/38
U.S. Cl. 342—14 **8 Claims**

1. A method for reflecting electromagnetic energy which

comprises the step of imposing in the path of the electromagnetic energy a solution of a solvent and an organic electrolyte, said solution having a dielectric constant of at least ninety at 25° C.

4,638,317

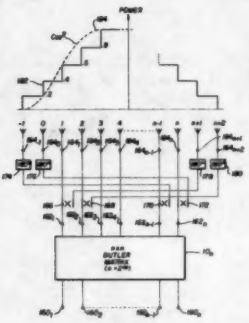
ORTHOGONAL BEAM FORMING NETWORK

Gary E. Evans, Trappe, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,300

Int. Cl.[4] H01Q *03/40*

U.S. Cl. 342—373 **20 Claims**



1. A method of expanding an orthogonal beam forming matrix, having a first plurality of antenna elements ports, into a matrix having a second plurality of ports, said second plurality of ports being coupled to a respective number of antenna elements greater in number than said first plurality of ports, comprising the steps of:

isophase coupling said first plurality of ports to a like number of respectively positioned ports of said second plurality of ports;

coupling at least one port of said first plurality of ports to a corresponding numbered additional port of said second plurality of ports adjacent the isophase coupled ports; and

effecting an additional 180° phase shift of signals coupled between said at least one port and said additional port.

4,638,318

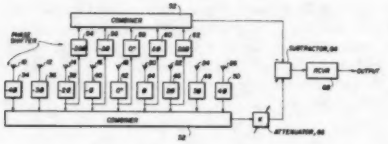
SMALL ANGULAR BEAMWIDTH ANTENNA SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,735

Int. Cl.[4] H04B *15/00*; H01Q *25/00*

U.S. Cl. 342—383 **9 Claims**



1. A narrow beamwidth radio frequency antenna system for eliminating undesired interference signals at the receiver end of communications trunk transmission links operating in a dense communications environment comprising:

a first receiving antenna including a first phased linear array of a first number of like antenna elements progressively phase shifted in predetermined incremental steps of a first angle to provide a first relatively narrow beamwidth directive antenna pattern providing reception of signals in a predetermined narrow angular sector corresponsing to said first pattern;

a second receiving antenna including a second phased linear array of a second smaller number of like antenna elements progressively phase shifted in predetermined incremental steps of a second larger angle to provide a second relatively narrow beamwidth directive antenna pattern providing reception of signals in a narrow angular sector corresponding to said second pattern greater than said first antenna pattern;

means for scanning said antenna patterns such that said patterns overlap with one side thereof being substantially mutually coincident providing a single small incremental angular sector between the other sides of said first narrow sector and greater second sector where said antenna patterns do not overlap;

first means for combining signals from said first number of antenna elements and first phase shifted angle;

second means for combining signals from said second number of antenna elements and second phase shifted angle; and

means for subtracting signals from said first and second combining means providing signal cancellation of substantially all signals arriving at said overlapping antenna patterns and having only the remaining single incremental antenna pattern angular sector for receiving signals.

4,638,319

R.F. SYSTEM

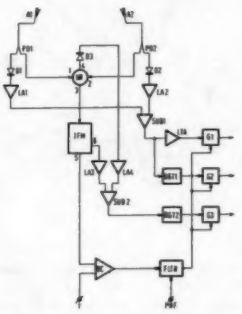
Lye-Whatt Chua, South Nutfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1984, Ser. No. 621,029

Claims priority, application United Kingdom, Jun. 17, 1983, 8316499

Int. Cl.[4] G01S *5/02, 13/46*

U.S. Cl. 342—417 **9 Claims**



1. An R.F. direction-finding system for determining the direction of incidence R.F. radiation without down conversion to I.F., said system comprising:

(a) first and second antennas disposed on opposite sides of a direction-indicating axis and having respective main lobe axes angled such that they intersect on said direction-indicating axis;

(b) first and second diode detector means each coupled to both of the first and second antennas;

(c) phase comparison means coupled to the first diode detector means for producing a single signal having a magnitude which varies continuously with the direction of incidence of R.F. radiation over a predefined operating range, said magnitude representing first and second angles of incidence on opposite sides of a predefined direction,

one of said first and second angles being the actual direction of incidence of the R.F. radiation; and

(d) amplitude comparison means coupled to the second diode detector means for producing a signal having a magnitude r

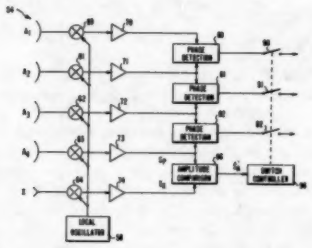
(d) amplitude comparison means coupled to the second diode detector means for producing a signal having a magnitude representing the relative magnitudes of signals produced by the first and second antennas in response to the incident R.F. radiation, said magnitude approximately representing the direction of incidence of the R.F. radiation relative to said predefined direction, said signal designating which of the angles determined by the phase comparison means accurately represents the direction of incidence of the R.F. radiation.

4,638,320

DIRECTION FINDING INTERFEROMETER

Dennis J. Eggert, Hermosa Beach; Charles E. Hendrix, Pacific Palisades, and Barnet Krinsky, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 5, 1982, Ser. No. 439,458
Int. Cl.⁴ G01S *5/04*
U.S. Cl. 342—442 **4 Claims**



1. A two-dimensional, long-baseline direction finding interferometer receiving system comprising:

a plurality of primary antenna receiving means, said plurality comprising

four primary antenna receiving means arranged in a two-dimensional planar fashion, with three of said primary antenna means being positioned on two orthogonal axes, and

a remaining one of said primary antenna means positioned on a third axis, which is arranged asymmetrically and non-orthogonally to said orthogonal axes;

an auxiliary antenna receiving means for permitting said system to reject errant signals;

a common local oscillator means;

a plurality of mixer means, each of which is connected respectively to one of said antenna receiving means and said common local oscillator means;

a plurality of filter amplifier means, each of which is adapted to receive the output signal from a corresponding one of said mixer means;

a plurality of phase detection means, each of which is adapted to compare the output signals of two adjacent filter amplifier means;

an amplitude comparison means which is adapted to compare the output signal of one of said primary antenna means with the output signal of said auxiliary antenna means, said amplitude comparison means producing an output acceptance signal when the amplitude of said signal from one of said primary antenna means exceeds the amplitude of said signal from said auxiliary antenna means;

a plurality of switches, each of which is adapted to receive the output signal from one of said phase detection means; and

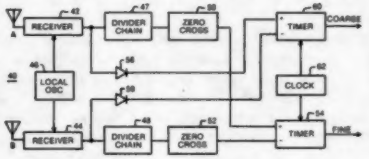
a switch controller connected to said amplitude comparison means is adapted to close said plurality of switches when said output acceptance signal is present to allow said signals from said plurality of phase detection means to propagate through said interferometer receiving system for further processing.

4,638,321

UNAMBIGUOUS WIDE BASELINE INTERFEROMETER

Edwin M. Drogin, Dix Hills, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 1, 1984, Ser. No. 616,098
Int. Cl.⁴ G01S *5/02*
U.S. Cl. 342—444 **20 Claims**



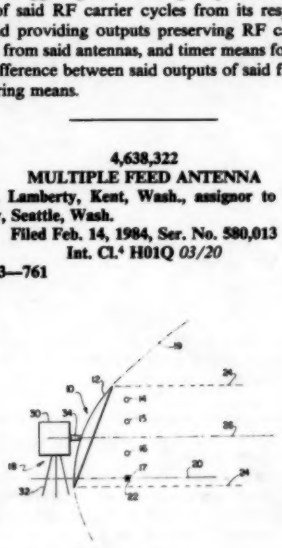
1. In a system for receiving an RF signal having envelopes of RF carrier cycles, said RF carrier cycles having zero crossings, means for measuring the differential arrival time of said RF signal at two antennas spaced apart by a distance greater than one wavelength of the RF carrier, comprising first and second triggering means, one for each antenna, each said first and second triggering means having a digital output, said first and second triggering means being responsive to said zero crossings of said RF carrier cycles from its respective said antenna and providing outputs preserving RF carrier phase differential from said antennas, and timer means for measuring the time difference between said outputs of said first and second triggering means.

4,638,322

MULTIPLE FEED ANTENNA

Bernard J. Lamberty, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 14, 1984, Ser. No. 580,013
Int. Cl.⁴ H01Q *03/20*
U.S. Cl. 343—761 **9 Claims**



1. A multiple feed antenna, comprising:

a primary focussing element having a focal axis;

at least two feeds, said feeds being spaced from each other;

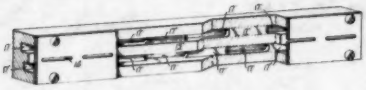
means for moving said primary focussing element to a different position for each said feed such that each of said feeds is individually positioned on said focal axis; and

wherein said moving means produces rotation of said focussing element about an axis parallel to said focal axis such that said antenna has a common boresight in each of said different positions of said focussing element.

4,638,323
ASYMMETRIC RIDGE WAVEGUIDE COLLINEAR SLOT ARRAY ANTENNA

Harold Shnitkin, Roslyn, N.Y., and Julius Green, Trumbull, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 25, 1985, Ser. No. 727,316
Int. Cl.[4] H01Q *13/12*
U.S. Cl. 343—771 **5 Claims**

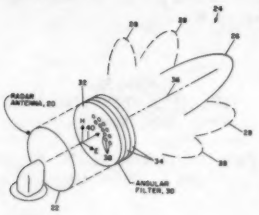


1. A slotted array antenna, comprising a plurality of waveguide elements each comprising opposite radiating and non-radiating sides, wherein said waveguide elements are characterized in that said radiating side defining a series of radiating slots along a centerline thereof, in that said non-radiating side includes an axial ridge of constant height directed toward said radiating slots, and in that each of said waveguide elements defines first and second pluralities of alternating side chambers on opposite sides of said axial ridge, said alternating side chambers alternating between predetermined high and low levels, whereby secondary radar beams are eliminated.

4,638,324
RESISTIVE LOOP ANGULAR FILTER

Peter W. Hannan, Smithtown, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Dec. 10, 1984, Ser. No. 679,844
Int. Cl.[4] H01Q *15/02*
U.S. Cl. 343—909 **12 Claims**



1. An angular filter which attenuates electromagnetic energy of a wave incident upon and propagating through the filter, the attenuation being dependent upon the angle of the filter, said filter comprising:

an array of resistive elements disposed parallel to a surface substantially normal to a direction of propagation of the electromagnetic wave;

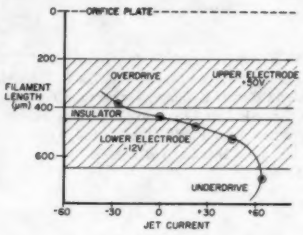
a dielectric support substantially transparent to the wave and being disposed along said surface, each of said elements being surrounded by said dielectric and being held in preset positions of said array by said support; and wherein

each of said elements being electrically independent of the other elements, each of said elements comprising an electrically conductive member curved in a plane normal to said direction of propagation for interaction with the magnetic vector component of a portion of a wave having an axis of propagation angled relative to said direction of propagation, there being essentially no interaction between each of said elements and said magnetic vector for zero angle of incidence resulting in substantial transparency of said filter to electromagnetic waves incident at zero angle of incidence, said interaction with a consequent attenuation of the energy increasing with increasing angle of incidence.

4,638,325
INK JET FILAMENT LENGTH AND STIMULATION AMPLITUDE ASSESSMENT SYSTEM

John M. Schneider, Spring Valley; Michael J. Piatt, enon; Mark E. Brown, West Carrollton, and Mark C. Bowers, Vandalia, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 9, 1985, Ser. No. 773,496
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—1.1 **30 Claims**



1. A method for sensing the length of an ink jet filament in response to stimulation amplitude in a continuous ink jet printer, characterised by:

locating a narrow charging electrode, extending less than or equal to one drop spacing in the direction of the ink jet filament, adjacent the ink jet filament and applying a charging voltage to the narrow electrode;

changing the amplitude of the stimulation signal to change the length of the ink jet filament;

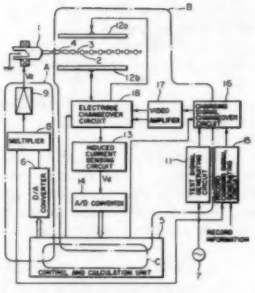
detecting the magnitude of the charge imparted to the ink drops by the narrow charging electrode; and

sensing the length of the ink jet filament as a function of the detected charge.

4,638,326
INK JET RECORDING APPARATUS

Takahiro Yamada, Ibaraki; Satoshi Namekawa, Hitachi; Eiji Yoshino, Hitachi, and Yasumasa Matsuda, Hitachi, all of Japan, assignors to Hitachi, Ltd.; Hitachi Seiko Ltd. and Hitachi Koki Co., Ltd., all of Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,813
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—75 **2 Claims**



1. In an ink jet recording apparatus including:

a nozzle;

means for introducing ink into said nozzle and jetting said ink from the nozzle orifice;

means for exciting said nozzle so as to alternately separate the leading end of an columnar ink stream jetted from said nozzle into ink droplets of large diameter and ink droplets of small diameter and make those ink droplets fly toward the recording medium;

deflection control means for charging and deflecting the ink droplets according to the record signal so as to cause the ink droplets to impinge against said substance to be recorded thereon at predetermined positions thereof; and

a record condition optimizing device for setting the optimum excitation voltage of said nozzle excitation means in order to ensure the generation and charging of the ink droplet,

an ink jet recording apparatus wherein said record condition optimizing device comprises:

first means for sweeping the excitation voltage on the substantially logarithmic scale;

second means for successively detecting an excitation voltage value which causes an ink droplet of large diameter to be separated from the columnar ink stream and generated at a phase θ_k, and an excitation voltage value which causes an ink droplet of small diameter to be separated from the columnar ink stream and generated at the phase θ_k; and

third means for, on the basis of the results detected by said second means, calculating a space Wn on the logarithmic scale between an excitation voltage value vn generating an ink droplet of small diameter and an excitation voltage value Vn generating an ink droplet of large diameter which is adjacent to and lower than said excitation voltage value vn, calculating a space wn on the logarithmic scale between said excitation voltage value vn generating an ink droplet of small diameter and an excitation voltage value Vn+1 generating an ink droplet of large diameter which is adjacent to and higher than said excitation voltage value vn, calculating the value of $|Wn-wn|$, and setting the excitation voltage at such a value as to minimize the value of $|Wn-wn|$.

4,638,327

APPARATUS TO DAMP TURBULENCE IN AN INK JET FLUID SUPPLY CHAMBER

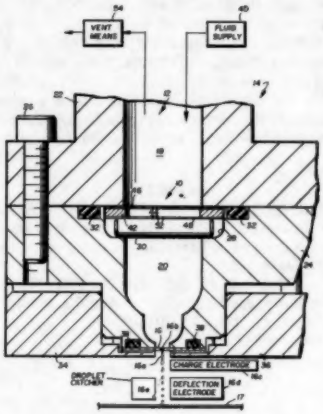
Richard Sutera, Centerville; John L. Dressler, Spring Valley, and Bruce W. Halliday, Centerville, all of Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 8, 1985, Ser. No. 720,735
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**

1. Turbulence damping structure for a fluid supply chamber of an ink-jet printing head assembly comprising:

upper and lower damping members each defining upper and lower apertures, respectively; and

a support member having plural openings therein, said support member being rigidly fixed between and separating said upper and lower damping members and, together with said upper and lower damping members, dividing said fluid chamber into upper and lower subchambers such that said openings establish fluid communication between respective ones of said upper and lower apertures, wherein said openings between said upper and lower damping members define a plurality of fluid quieting chambers, and wherein said damping fluid structure



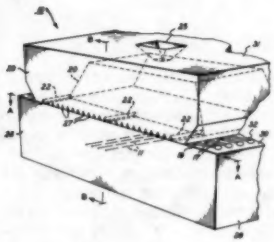
provides step-wise damping of fluid in said fluid supply chamber.

4,638,328

PRINTHEAD FOR AN INK JET PRINTER

Donald J. Drake, Rochester; William G. Hawkins; Roger G. Markham, both of Webster, and Richard V. LaDonna, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 1, 1986, Ser. No. 858,143
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **11 Claims**



1. In a continuous stream ink jet printer of the type having a printhead with a manifold for containing a replenishable supply of ink, a plurality of orifices, and individual channels connecting the orifices to the manifold for providing ink flow paths therebetween, the printhead comprising:

a first substrate having one edge and having on one surface thereof at least one heating element and addressing electrodes for providing current pulses thereto;

a second substrate having one edge and containing a recess and a plurality of parallel grooves in one surface thereof, one end of the grooves extending through the edge of the second substrate and the other end opening into the recess;

the first and second substrates being mated and permanently bonded together, so that their respective edges lie in the same plane and the recess and grooves are closed by the first substrate to produce the manifold and channels, respectively, with said at least one heating element contactable by the ink, the channel groove ends that penetrate the second substrate edges serving as the orifices;

means to continually supply pressurized ink to the manifold; and

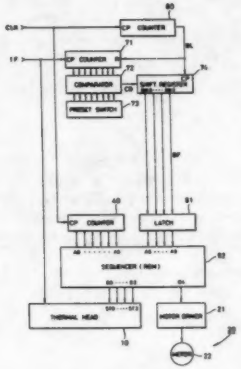
circuit means to provide said at least one heating element with a continual series of current pulses via the addressing electrodes at a predetermined frequency and power, so that the ink contacting the at least one heating element during the application of thermal pulses sustains a constant uniform change in the density, viscosity, or surface tension of the ink because of a fluctuation in temperature without the temperature of the ink being raised to a level that would vaporize or produce a change of state therein.

4,638,329

THERMAL RECORDING METHOD AND APPARATUS

Toshihiko Nakayama; Fujio Moriguchi; Tomio Murayama, and Yasuhiro Takeo, all of Ebina, Japan, assignors to Fuji-Xerox Co. Ltd., Japan

Filed Aug. 29, 1985, Ser. No. 770,708
Claims priority, application Japan, Aug. 31, 1984, 59-182934
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **12 Claims**



1. In a thermal recording method for printing picture information for one unit by a multi-element thermal head simultaneously or with a plurality of times, in which the number of printing operations for one unit made by said thermal head is determined by the ratio of black data and white data to be printed contained in the picture information for one unit, the improvement comprising that said picture information for one unit is divided into a plurality of blocks, the number of black data points in each block is counted and compared to a standard to generate an over the standard or under the standard signal for each of the blocks and said number of printing operations is determined by the signals associated with each of said divided blocks.

4,638,330

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 4, 1985, Ser. No. 741,136
Claims priority, application Japan, Jun. 11, 1984, 59-119515
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **24 Claims**

1. An image forming apparatus employing image-forming signals for forming an image on a sheet, comprising:

a transfer medium having four regions coated with ink arranged serially along the length of said transfer medium, said four regions respectively comprising coatings of yellow, magenta, cyan and black inks, said yellow, magenta and cyan ink regions having substantially the same sizes, said black ink region being different in size from each of said three other regions;

holding means for holding said transfer medium; and

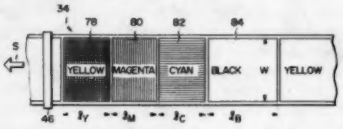


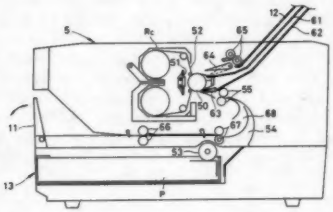
image forming means for forming an image by applying said cyan, magenta and yellow inks one over another in accordance with color signals representing a color image and for transferring black ink in response to a black-color signal.

4,638,331

IMAGE BUILDING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1985, Ser. No. 758,750
Claims priority, application Japan, Jul. 27, 1984, 59-156718
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



1. An image forming apparatus comprising:

a platen for transporting a sheet of printing medium while the latter is partially wound about said platen,

a strip of ink donor medium having a width less than the width of the printing medium,

ink donor supporting and transporting means for supporting and transporting the ink donor medium which is spanned between a pair of cores while both end parts of the printing medium as seen in a transverse direction, which is essentially perpendicular to the transport direction of said printing medium and of said ink donor supporting and transporting means, are exposed outside of said ink donor medium when the ink donor medium is brought in contact with the printing medium,

a printing head adopted to be displaced toward and away from the platen to thermally transfer at least one coloring agent on the ink donor medium to the printing medium when said printing head and the printing medium come in pressure contact with the platen with the ink donor medium interposed therebetween;

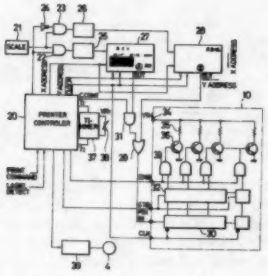
a pair of retaining members disposed at said both ends of the printing medium as seen in said transverse direction to thrust the exposed ends of the printing medium against the platen under the effect of a thrusting force given by said retaining members, and

driving means for displacing said retaining members toward and away from said platen.

4,638,332
THERMAL PRINTER

Yasuhiro Sakura; Hitoshi Nimura, and Satoshi Nakayama, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,612
Claims priority, application Japan, Feb. 21, 1985, 60-33385
Int. Cl.[4] G01D 15/16
U.S. Cl. 346—76 PH 4 Claims

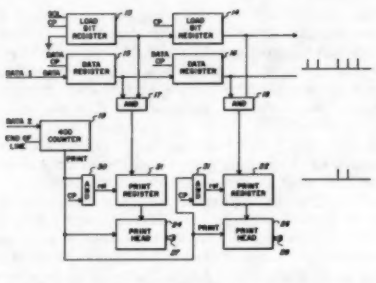


1. A thermal printer apparatus comprising:
recording papers each having multi-color-forming temperature characteristic;
a thermal head containing a multiplicity of heating elements and capable of printing the recording paper over the entire width thereof while being kept in contact therewith during its unidirectional motion;
at least two print buffers for feeding print data to control energization of the heating elements of said thermal head;
and a current on-time control circuit for differentially setting the on-time periods of a constant current to the heating elements of said thermal head in response to selection of said print buffers under the predetermined condition that a basic color for general print data is formed at a low temperature while a different particular color for specific print data is formed at a high temperature in a printing operation on the recording paper by the heating elements of said thermal head, wherein the current on-time is extended only when said print buffer for the different particular color has the print data therein.

4,638,333
THERMAL PRINTING CIRCUIT

I-an Feng, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1985, Ser. No. 791,483
Int. Cl.[4] G01D 15/10
U.S. Cl. 346—76 PH 4 Claims



1. A circuit for controlling a thermal printer to print a line of data by using thermal print elements comprising:
a modulo n counter for counting bits of one state in said line, said state being the one which requires its associated print element to be turned on,
means responsive to said counter for dividing said line into a plurality of segments having variable numbers of bits of both sides each of which, except the last, contains n bits of said one state, and a last segment containing the remainder of said bits of said one state, and
printing means responsive to said means for dividing for printing all of the bits of each segment in parallel and for completing the printing of one segment before starting the printing of the next segment.

4,638,334
ELECTRO-OPTIC LINE PRINTER WITH SUPER LUMINESCENT LED SOURCE

Robert D. Burnham, Palo Alto; Thomas L. Paoli, Los Altos; Robert L. Thornton, East Palo Alto, and Robert A. Sprague, Saratoga, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 3, 1985, Ser. No. 719,595
Int. Cl.[4] G01D 9/42
U.S. Cl. 346—108 7 Claims

1. In an electro-optic line printer comprising
a recording medium,
an electro-optic line modulator for presenting picture elements in spatially predetermined positions along a printing line laterally of said recording medium and having an optically transmissive electro-optic element and a plurality of spaced, addressable electrodes disposed on one side of said electro-optic element forming at the interface with said element an interactive region,
an LED side-facet source for producing an output light beam from a side facet thereof and comprising a semiconductor laser structure converted to a superluminescent source characterized by having high output intensity and a uniform far field pattern without intensity variations along the beam width,
optical means for collecting the light from said LED side-facet source onto said interactive region of said modulator, said optical means comprising a first lens means to collect the light emitted from said LED side-facet source in the tangential and sagittal directions and second toric lens means to collimate said light into a sheetlike beam in said tangential direction and focus said light in the sagittal direction to a line at said interactive region,
imaging means optically aligned between said modulator and said recording medium for imaging said beam onto said recording medium, and
means for advancing said recording medium at a predetermined rate in a cross line direction relative to said printing line.

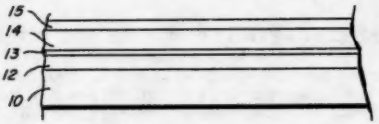
4,638,335
OPTICAL RECORDING MEMBER

Thomas W. Smith, Penfield; Anthony T. Ward, Webster; David J. Luca, Rochester, and Gordon E. Johnson, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 566,765, Dec. 29, 1983, abandoned.
This application Nov. 8, 1985, Ser. No. 795,757
Int. Cl.[4] G01D 15/34
U.S. Cl. 346—135.1 45 Claims

1. A multi-layer optical recording member for use with a recording laser for optically recording and retrieving informa-

tion thereon comprising in sequential order a structural substrate, a thermally degradable polymer layer, a thin light absorbing recording layer, a thermally degradable polymer dielectric layer and a reflective layer, said substrate and said thermally degradable polymer layers being stable under ambient light and temperature conditions and substantially transparent to the recording and reading optical radiation, the combined thickness of said light absorbing layer and said dielectric layer being such as to provide anti-reflecting conditions at the recording wavelength and optical contrast between marked



and unmarked areas at the reading wavelength, said thermally degradable polymer layers decomposing substantially to gaseous products at temperatures below the melting point of the light absorbing recording layer wherein, upon exposure to recording radiation the portion of the light absorbing layer exposed is heated by the absorbed energy which in turn heats adjacent areas of both thermally degradable polymer layers to a level where at least some polymer decomposition with the consequent evolution of gaseous decomposition products occurs resulting in the formation of a hole in the exposed area of the light absorbing layer.

4,638,336

COVER FOR VACUUM INK PRINTING HEAD

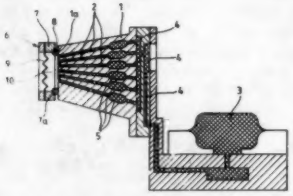
Wilfried Hofmann, Taufkirchen, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,356

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432620

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**



1. A cover for nozzles of a vacuum ink printing head having an end side and a predetermined surface tension of meniscus-shaped ink surfaces in its nozzles during non-use, the cover comprising a circumferential sealing element formed so that when the cover is arranged on the printing head said sealing element abuts against the end side of the printing head; and a diaphragm arranged so that said sealing element and said diaphragm together form a pressure chamber, said diaphragm being formed so that its own tension is smaller than the surface tension of the meniscus-shaped ink surfaces in the nozzles during non-use.

4,638,337

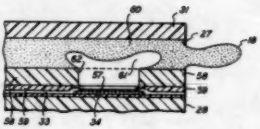
THERMAL INK JET PRINTHEAD

Peter A. Torpey, Rochester, N.Y., and Roger G. Markham, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1985, Ser. No. 761,922

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **3 Claims**



1. A thermal ink jet printhead for ejecting and propelling ink droplets on demand therefrom along a flight path from orifices in the printhead toward a recording medium spaced therefrom by momentarily heating ink located in straight capillary channels within the printhead that interconnect respective ones of the orifices with an ink supplying reservoir also within the printhead, the channels and orifices having substantially equal cross-sectional areas, thus forming a straight ink flow path therebetween to produce temporary vapor bubbles in the channels, the heating of the ink being in response to electrical input signals representing digitized signals selectively applied to individual heating elements located one each in the channels adjacent the orifices, the printhead comprising:

an upper substrate having first and second parallel surfaces and two opposing, parallel edge faces that are perpendicular to the substrate surfaces, the first surface containing a depression and a plurality of parallel straight grooves, one end of the grooves perpendicularly penetrating one upper substrate face and the other ends of the grooves opening into the depression;

a lower substrate having first and second parallel surfaces and an edge face perpendicular to the lower substrate surfaces, a plurality of heating elements having surfaces with predetermined areas and being formed in a row on the lower substrate first surface parallel with and a predetermined distance from the lower substrate face, together with respective electrodes for selectively addressing the heating elements with said electrical input signals, the addressing electrodes having terminal ends at the edges of the lower substrate first surface other than the one adjacent its edge face;

a passivation layer covering the lower substrate first surface, including said addressing electrodes, but excluding the heating element surfaces and the terminal ends of the addressing electrodes, these having been cleared of the passivation layer;

a thick film insulative layer having a predetermined thickness overlaying only the passivation layer, so that the thickness of the thick film layer provides substantially perpendicular walls that individually surround each of the heating elements, thus placing each heating element surface at the bottom of a recess produced by said thick film walls;

said upper and lower substrate being aligned and bonded together to form the printhead with their respective first surfaces being confrontingly joined and with the upper substrate face having the groove penetrations being coplanar with the lower substrate face, so that the upper substrate depression and grooves respectively become the ink reservoir and the ink channels, the groove penetrations in the upper substrate face become the orifices, the alignment of the upper and lower substrates places one recessed heating element in each channel a predetermined distance from an associated orifice, so that the thick film walls

inhibit the growth of the vapor bubbles in a direction paraliel with the ink flow path in said channels while promoting bubble growth in a direction normal to the heating elements, whereby the heating element recess in said thick film layer enables closer placement of the heating elements to the orifices and the consequent ejection of higher velocity droplet and yet prevents vaporized ink blowout during said droplet ejecting bubble generation;

means for connecting the printhead reservoir to a source of ink under a predetermined pressure external to the printhead; and

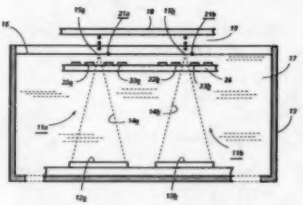
means for addressing the electrode terminal ends with said input signals.

4,638,338

CAPILLARY WAVE CONTROLLERS FOR NOZZLELESS DROPLET EJECTORS

Scott A. Elrod, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1986, Ser. No. 820,045
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **18 Claims**



1. In combination with a nozzleless droplet ejector having a pool of liquid with a free surface, and means for launching a pressure wave into said pool such that said pressure wave comes to a focus approximately at said free surface, the improvement comprising a capillary wave emission controller for said ejector; said controller including

a conductor and a counter electrode, said conductor being shallowly immersed in said pool and being proximate to the focus of said pressure wave, and

means coupled across said conductor and said counter electrode for applying a periodic voltage therecross on command to cause a free propagating capillary surface wave to radiate from said conductor, whereby said capillary wave interacts with said pressure wave to control at least one emission characteristic of said ejector.

4,638,339

ELECTROGRAPHIC CHARGE DEPOSITION APPARATUS

Richard J. Coburn, West Hartford; Walter C. Dean, III, Simsbury, both of Conn.; Thomas D. Kegelman, Palm Harbor, Fla., and Norman L. Milliard, Stafford Springs, Conn., assignors to KCR Technology, Inc., Hartford, Conn.

Filed Nov. 4, 1985, Ser. No. 794,640
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—153.1 **10 Claims**

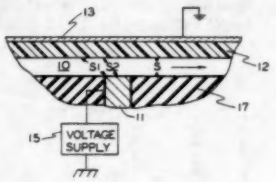
1. Apparatus for establishing the spacing between a conductive member and a moving dielectric member in an electrogaphic printer comprising:

a flexible dielectric member having an electrically conductive ground plane backing element and reinforcing layer;

support means for the dielectric member including two closely spaced support areas defined by parti-cylindrical surfaces engaging the dielectric member and defining an unsupported region of the dielectric member therebetween,

a conductive member and means supporting said conductive members in the unsupported region of the dielectric member and spaced therefrom;

the bending modulus of said dielectric and reinforcing members being sufficient to preclude contact with the conductive member between said support areas when said dielectric member is in tension,



whereby the desired spacing between the conductive member and the electric member to effect electrostatic charge deposition occurs in the unsupport region of the dielectric member.

4,638,340

TWO-COLOR THERMOSENSITIVE RECORDING LABEL

Kiyotaka Iiyama, Mishima, and Norihiko Inaba, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,736
Claims priority, application Japan, Jul. 27, 1984, 59-158054
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—204 **13 Claims**

1. A two-color thermosensitive recording label capable of forming two different colors when heated at different temperatures comprising:

(a) a support material,

(b) a first thermosensitive coloring layer which is colored in a first color at a predetermined high temperature T, formed on one side of said support material, comprising a coloring agent and a first color developer capable of inducing color formation in said coloring agent when heated to the temperature T,

(c) a decolorizing layer containing a decolorizing agent, formed on said first thermosensitive coloring layer,

(d) an intermediate layer formed on said decolorizing layer,

(e) a second thermosensitive coloring layer comprising a leuco dye and a second color developer capable of inducing color formation in said leuco dye when heated, formed on said intermediate layer, which coloring layer is colored in a second color at a predetermined low temperature t which is lower than said temperature T, said second color developed at said low temperature t being different from said first color, decolorized by said decolorizing agent when heated to a predetermined temperature which is higher than the temperature t so as to prevent the color developed in said second thermosensitive coloring layer from being mixed with said color developed in said first thermosensitive coloring layer comprising a thermofusible material and said second thermosensitive coloring layer and said second color being protected from said decolorizing layer by said intermediate layer so long as said second thermosensitive coloring layer is not heated up to said predetermined temperature,

(f) a protective layer for protecting said second thermosensitive coloring layer, formed on said second thermosensitive coloring layer,

(g) an adhesive layer formed on the other side of said support, and

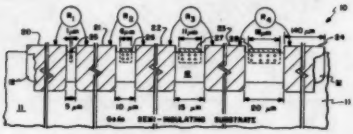
(h) a disposable backing sheet which is attached to said adhesive layer and can be peeled off said adhesive layer when said thermosensitive recording label is used.

4,638,341

GATED TRANSMISSION LINE MODEL STRUCTURE FOR CHARACTERIZATION OF FIELD-EFFECT TRANSISTORS

Steven M. Baier; Nicholas C. Cirillo, Jr.; Steven A. Hanka, all of Minneapolis, and Michael S. Shur, Golden Valley, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 6, 1984, Ser. No. 647,769
Int. Cl.[4] H01L *29/48, 29/56, 29/64*
U.S. Cl. 357—15 12 Claims



1. A gated transmission line model TLM pattern for use in field-effect transistor characterization, comprising:

a semiconductor substrate having a major surface which has a conducting channel of uniform width formed into and along a region on said surface;

a plurality of at least four spaced ohmic contacts deposited on the substrate surface at and along said conducting channel region;

wherein a first space between a first and a second of said ohmic contacts is a different dimension from a second space between the second and a third of said ohmic contacts, and a third space between said third and fourth of said ohmic contacts is a different dimension from the first and second spaces;

a plurality of at least three Schottky metal gates deposited on said surface, one gate being deposited, respectively, in each of said spaces between the plurality of ohmic contacts, the dimension of the gate being smaller than the dimension of the space it is in to establish a gate-to-ohmic spacing,

whereby the plurality of Schottky metal gates includes a first, a second and a third gate positioned in said first, second and third spaces, respectively, with the length of each of said gates being x (where x is a number) microns smaller than the dimension of the related space so that the gate-to-ohmic spacing remains the same in each of said spaces.

4,638,342

SPACE CHARGE MODULATION DEVICE

John L. Freeouf, Peekskill; Thomas N. Jackson, Ossining; Steven E. Laux, Mount Kisco, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

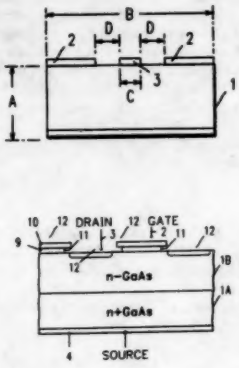
Filed Sep. 17, 1982, Ser. No. 419,381
Int. Cl.[4] H01L *29/56*
U.S. Cl. 357—15 10 Claims

1. A semiconductor structure comprising in combination:

a single band gap semiconductor material body having at least a first surface,

a first contact on said first surface of said body, said first contact having at least one dimension of the order of the Debye length in said semiconductor,

a second essentially rectifying contact on said first surface positioned within said Debye length of said first contact, and



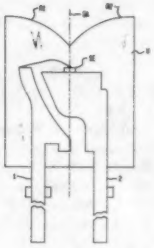
a third contact to said semiconductor body positioned remote from said first and second contacts.

4,638,343

OPTICAL RADIATION SOURCE OR DETECTOR DEVICE HAVING PLURAL RADIATING OR RECEIVING CHARACTERISTICS

Hans-Ludwig Althaus, Lappersdorf; Jörg Klann, Thumhausen, and Wilhelm Kuny, Grünwald, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,236
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1985, 8500013[U]
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 8 Claims

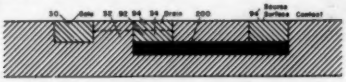


1. An optical device including an envelope (U) having light refractive surfaces which provide a desired optical characteristic, the envelope of the optical device comprising at least two light refractive surfaces having lenticular curves (L 1, L 2) each with a far focus inside the envelope that are coincident in location, the optical device being disposed at the location and the two refractive surfaces defining two light propogation paths from them to the optical device.

4,638,344
JUNCTION FIELD-EFFECT TRANSISTOR CONTROLLED BY MERGED DEPLETION REGIONS

Walter T. Cardwell, Jr., 217 Bedford Forrest Ave., Anderson, S.C. 29621

Continuation-in-part of Ser. No. 83,092, Oct. 9, 1979. This application Apr. 15, 1982, Ser. No. 368,839
Int. Cl.[4] H01L *29/80, 27/04*
U.S. Cl. 357—22 52 Claims

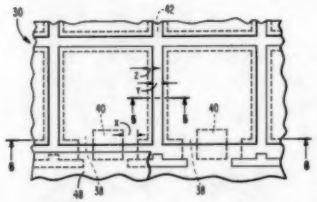


1. A semiconductor device comprising:
a first semiconductor region of first conductivity type;
a second semiconductor region of second conductivity type opposite to said first conductivity type, said second region forming a PN junction with said first region;
said first region being sufficiently thin and having sufficiently low doping level that a depletion region formed by reverse biasing said PN junction can extend into said first region;
first means for electrically contacting said first region;
spaced second and third means for electrically contacting said second region;
means for applying a first constant voltage between said first electrical contacting means and said second or third electrical contacting means of a polarity to reverse bias the PN junction;
gate means contacting said first semiconductor region in a manner so as to form a potential barrier with the first semiconductor region such as to permit a depletion region to be created in the first semiconductor region upon suitable bias, said gate means being spaced from the second semiconductor region by the first semiconductor region;
fourth means for applying a signal voltage between the gate means for the first region, said signal voltage having at least intermittently a sufficient magnitude and polarity to create a depletion region in the first region which merges with the depletion region due to the reverse bias applied to the PN junction by said first voltage so that the impedance of the second region is controlled by said signal voltage.

4,638,345
IR IMAGING ARRAY AND METHOD OF MAKING SAME

Hammam Elabd, East Windsor, and Walter F. Kosonocky, Skillman, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 1, 1983, Ser. No. 500,187
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—24 7 Claims

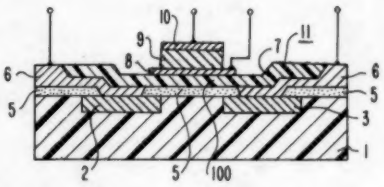


1. An array of infra-red detectors comprising
a substrate of single crystal silicon of one conductivity type,
a plurality of spaced apart detector areas of a conductive material at one surface of said substrate with each of said conductive areas forming a Schottky-barrier junction with said substrate,
each conductive area including a conductive coupling region of a conductivity type opposite to that of the substrate within the substrate under and in contact with a portion of the conductive material, and
means between adjacent detector areas isolating said areas from each other, said isolating means consisting of a region of a conductivity type opposite to that of the substrate in said substrate and extending along said one surface between said areas with each of said areas contacting said region, said region extending around the conductive areas and being spaced from the coupling regions.

4,638,346
FIELD EFFECT TRANSISTOR-TYPE MOISTURE SENSOR

Yasuhiko Inami; Masanori Watanabe, and Masaya Hijikigawa, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1985, Ser. No. 763,691
Claims priority, application Japan, Aug. 29, 1984, 59-182088
Int. Cl.[4] G01N *27/12*
U.S. Cl. 357—25 8 Claims



1. A field effect transistor-type moisture sensor comprising a field effect transistor device incorporated with a moisture sensitive means, the electrostatic capacity or the electrical conductivity of which varies with the absorption and the desorption of water vapor or moisture, wherein said moisture sensitive means is disposed on a double-layered gate insulating film of said field effect transistor device, a gate electrode is connected to said moisture sensitive means, an auxiliary electrode for the application of a drift-cancellation voltage to said moisture sensitive means is located at the interface between said gate insulating film and said sensitive means, and said moisture sensitive means is a film prepared by cross-linking cellulose acetate butyrate with at least one compound selected from the group consisting of compounds containing two or more isocyanate groups, compounds containing two or more epoxy groups, compounds containing two or more carboxylic acid groups, and acid anhydrides of carboxylic acids.

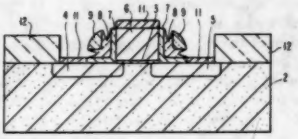
4,638,347
GATE ELECTRODE SIDEWALL ISOLATION SPACER FOR FIELD EFFECT TRANSISTORS

Subramanian S. Iyer, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 447,543, Dec. 7, 1982, abandoned. This application Aug. 9, 1985, Ser. No. 763,897
Int. Cl.[4] H01L *29/94, 29/78*
U.S. Cl. 357—54 11 Claims

1. A sidewall isolation structure for the gate electrode of an insulated gate field effect transistor which comprises a first electrical insulating material and a second and different electrical insulating material contiguous with said first electrical insulating material, and wherein said second and different electrical insulating material being etched below the surface level of said first electrical insulating material and being etched to a greater extent than and at a rate faster than said first elec-

trical insulating material to provide a recess in said sidewall isolation structure wherein said recess is such as to prevent the formation of a continuous metal film over the sidewall isolation.



4,638,348

SEMICONDUCTOR CHIP CARRIER

David F. Brown, 22 Waterpump Court, Thorplands, Northampton, and Michael J. Anstey, Penhallow, Kiln-Ride-Extension, Workingham, Berkshire, both of England

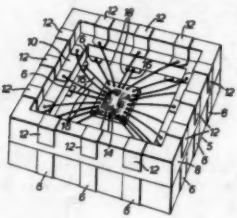
PCT No. PCT/GB83/00198, § 371 Date Mar. 30, 1984, § 102(e) Date Mar. 30, 1984, PCT Pub. No. WO84/00851, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 8, 1983, Ser. No. 595,454

Claims priority, application United Kingdom, Aug. 10, 1982, 8222947

Int. Cl.⁴ H01L *23/02*

U.S. Cl. 357—74 **17 Claims**



1. A chip carrier comprising:

a body of flat electrically insulating material of rectangular external configuration defining upper and lower major surfaces;

a first plurality of electrical contacts arranged side-by-side along the four sides of the upper surface and a second plurality of electrical contacts arranged side-by-side along the four sides of the lower surface, the contacts of the first plurality being separate from the contacts of the second plurality;

a single chip mounted on the insulating material and completely enclosed; and

electrical connections between the chip and the contacts,

the body of insulating material being a single square slab of insulating material having the chip mounted on the upper surface, the chip being enclosed by encapsulation.

4,638,349

METHOD OF AND CIRCUIT FOR DIGITALLY DEMODULATING AN AMPLITUDE-MODULATED SIGNAL PRODUCED BY SUPPRESSED-CARRIER AMPLITUDE MODULATION OF TWO CARRIERS OF THE SAME FREQUENCIES IN A PHASE-QUADRATURE RELATIONSHIP

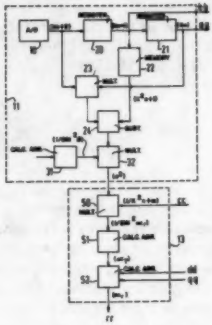
Gérard Le Floch, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

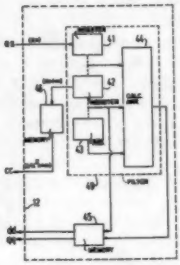
Filed Sep. 12, 1984, Ser. No. 649,872

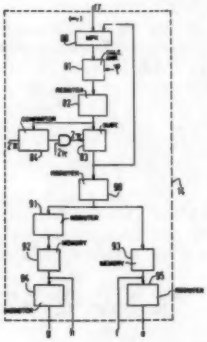
Claims priority, application France, Sep. 23, 1983, 83 15135

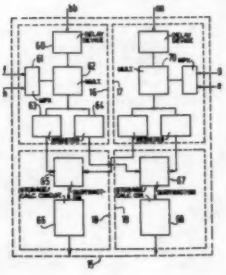
Int. Cl.⁴ H04N *9/65*

U.S. Cl. 358—23 **6 Claims**









1. A method of digitally demodulating an amplitude-modulated signal, produced by suppressed-carrier amplitude modulation of two quadrature-phase carriers of the same frequencies Fs, including determining the square a_2 of the peak amplitude a of a sinusoidal reference signal which is in syn-

chronism with the modulated signal, and sampling, at a rate defined by frequency Fe, said modulating signal being written:

$$m_{p+1}=u\cdot\cos(\alpha+K\phi)+v\sin(\alpha+k\phi)$$

wherein

$$\phi=\frac{\omega}{Fe}=2\pi\frac{Fr}{Fe},$$

α is an initial angular phase shift and k the number of periods $T=1/Fe$, characterized in that the method comprises the following steps:

determining and thereafter storing the sign of the reference signal x_{n+m} and the sign of the derivative of said reference signal at a predetermined instant t_{n+m} for which k is given the value zero;

determining at the instant t_{n+m} the square of the sine of the initial angular phase shift denoted as the real angular phase shift α_r or the inverse of this square in accordance with the expression $1/\sin^2\alpha_r=a^2/x^2_{n+m}$;

determining the values of sin α_r, thereafter a value α_T which corresponds to one of the values of arc sin α_r chosen in one of the four quadrants of a customary trigonometrical presentation;

determining the value of the real angular phase shift α_r from the value of α_T, knowledge of the selected quadrant, and the signs of the reference signal and the derivative of said reference signal for the same instant t_{n+m};

determining and thereafter storing, sequentially at each instant of the sampling rate, the values $\alpha_r+k\phi$ modulo 2π;

determining and storing, sequentially, pairs of values of sin $(\alpha_r+k\phi)$ and cos $(\alpha_r+k\phi)$, sin $(\alpha_r+(k-1)\phi)$ and cos $(\alpha_r+(k-1)\phi)$ for two consecutive instants of the rate; and

determining values which are proportional to the modulating signals u and y, from the two samples m_p and m_{p+1} of the modulated signal, by:

$m_p\sin(\alpha_r+k\phi)-m_{p+1}\cdot\sin(\alpha_r+(k-1)\phi)$
proportional to u

and

$m_{p+1}\cdot\cos(\alpha_r+(k-1)\phi)-m_p\cdot\cos(\alpha_r+k\phi)$
proportional to v.

4,638,350

COLOR IMAGE SENSING DEVICE

Tokuzo Kato, Chiba; Tsutomu Takayama, and Toshio Kaji, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,877

Claims priority, application Japan, Nov. 2, 1982, 57-193090

Int. Cl.⁴ H04N 9/64, 5/238

U.S. Cl. 358—29 **17 Claims**

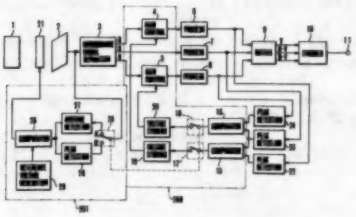
1. A color image sensing device comprising:

(a) image sensing means for converting an optical image into an electrical signal output having a plurality of color information components;

(b) peak detecting means for detecting the peak values of the plurality of color information components included in the output of said image sensing means;

(c) balance control means for adjusting the balance of peak levels of a plurality of color signals included in the output of said image sensing means so as to be equal to each other;

(d) switch means for changing between a first mode in which the adjustment by said balance control means is permitted and a second mode in which the adjustment has ceased; and



(e) attenuation control means for controlling the attenuation of the output level of said image sensing means according to whether said switch means is in the first mode or in the second mode, said attenuation control means first rendering the output level of said image sensing means smaller in the first mode than the output level of said image sensing means in the second mode.

4,638,351

ADAPTIVE FILTER FOR USE IN COLOR VIDEO SIGNAL PROCESSING

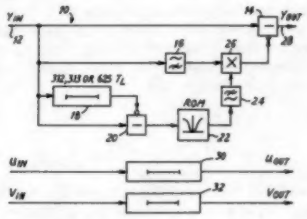
Christopher K. P. Clarke, Crawley, England, assignor to British Broadcasting Corporation, London, England

Filed Sep. 19, 1983, Ser. No. 533,766

Claims priority, application United Kingdom, Sep. 20, 1982, 8226798

Int. Cl.⁴ H04N 9/77

U.S. Cl. 358—38 **9 Claims**



1. A filter arrangement for filtering the luminance component of a colour video signal in which chrominance information is carried, in an encoded signal, in the upper portion of the luminance band, said filter arrangement comprising

an input for receiving a colour video luminance signal;

means being connected to said input and receiving the full bandwidth luminance signal for detecting movement in the scene content between successive frames of said video signal to produce a control signal; and

a filter connected to said input and the transmission characteristic of which in the said upper portion of said luminance band is dynamically variable, said filter being adapted to receive said control signal when movement is

detected so as to vary the filter transmission dynamically so as to attenuate the luminance signals in said upper portion relative to the signals in the remainder of said band.

4,638,352

COLOR VIDEO CAMERA SIGNAL PROCESSING CIRCUIT

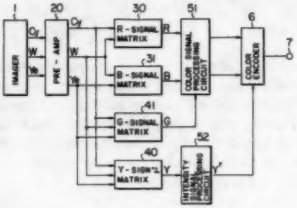
Masaru Noda, Fujisawa, and Toshihiro Shiga, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,523

Claims priority, application Japan, Sep. 16, 1983, 58-169184; Oct. 13, 1983, 58-189877

Int. Cl.[4] H04N *7/04, 9/64*

U.S. Cl. 358—44 **21 Claims**



1. A video camera signal processing circuit adapted to be connected to imaging means including photo-electric conversion means having a plurality of photo-sensors: arranged for generating a plurality of color signals in response to a plurality of color rays, comprising:

first intensity signal generating circuit means for generating a first intensity signal containing each of said color signals at predetermined proportions; said first intensity signal generating circuit means including proportion setting circuit means for setting said predetermined proportions such that products of said predetermined proportions for said respective color signals and ratios of sensitivities of corresponding photo-sensors are substantially equal; and

circuit means for generating color difference signals on the basis of said color signals, said color difference signal generating circuit means including color signal matrix circuit means for generating signals R (red) and B (blue) and a secondary intensity signal based on said color signals and processing circuit means for generating said color difference signals on the basis of said signals R and B and said second intensity signal.

4,638,353

ILLUMINATING MEANS FOR COLOR IMAGE SENSING

Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,520

Claims priority, application Japan, Sep. 5, 1983, 58-163582; Sep. 5, 1983, 58-163583; Sep. 5, 1983, 58-163584

Int. Cl.[4] A61B *1/04, 1/06;* **H04N** *7/18, 9/07*

U.S. Cl. 358—98 **11 Claims**

1. Color image sensing means of a sequential three color mode for an endoscope assembly, comprising:

an elongated insert member;

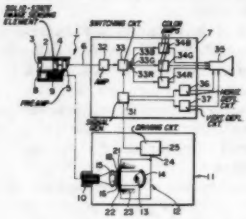
illuminating means having a light source for emitting illuminating light from the tip of said insert member;

a solid-state image sensing element positioned at the tip of said insert member and incorporating an imaging optical system for focussing the image of an object, illuminated by said illuminating means, on an image sensing surface having a great number of receiver elements having photoelectric conversion properties positioned on the focal plane of said imaging optical system;

video processor means for receiving the signals issued from said solid-state image sensing element and processing the signals by amplifying or the like to output the color signals at a predetermined timing;

color displaying means for displaying the color signals supplied from said video processor means;

filter means comprising a plurality of three color filters, and each color alternately arranged in the form of stripes arranged repeatedly at a predetermined pitch for transmitting each of said three colors of light therethrough, said



filter means positioned in an optical path between said light source and said solid-state image sensing element;

light transmitting means disposed proximal to said filter means and including light transmitting portions facing a group of said monochromatic filters for allowing light to pass therethrough and residual shutter portions for preventing light from passing therethrough;

vibrator means for reciprocating said filter means with respect to said light transmitting means sequentially so as to shift said group of monochromatic filters to a subsequent group of monochromatic filters of another color with respect to said light transmitting portions; and

driving means for supplying electrical signals for driving said vibrator means; thereby providing light to said solid-state image sensing means which has three different wave lengths successively by actuating said vibrator means.

4,638,354

RAPID PROFILE RECORDING DEVICE

Philippe Denimal, Pont-du-Chateau, France, assignor to PROGE, Paris, France

Filed Feb. 21, 1985, Ser. No. 703,710

Claims priority, application France, Feb. 23, 1984, 84 02927

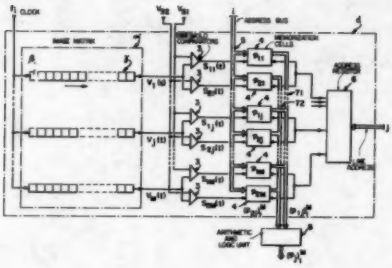
Int. Cl.[4] H04N *7/14*

U.S. Cl. 358—106 **12 Claims**

1. A profile recording device comprising a plurality of elementary photosensitive image points produced on the same semiconductor substrate in a matrix having M lines and P columns and adapted to accumulate electric charges in response to brightness information impinging thereon and representing collectively a profile to be recorded, and also comprising, associated with each of the M lines, means for reading and transfer of the electric charges accumulated by the image points in order to provide an electric signal $V_x(t)$ for each line which is a function of the electric charges, said means being organized for a reading in parallel of the M lines, characterized by the fact that said device comprises, integrated on the same said semiconductor substrate,

(a) at least one threshold comparator per line responsive to the corresponding electric line signal $V_x(t)$ for providing an indication of a variation of the level of said electrical signal, at least one memorization cell per comparator,

means for recording in said respective memorization cells the positions in space where each of said variations in level



occurs, thereby establishing M positions in space representing the profile; and

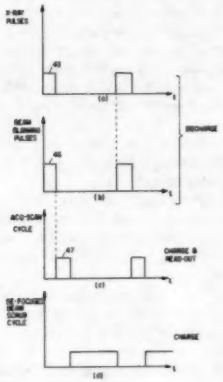
(b) means for the reading of said M positions in space.

4,638,355

SYSTEM AND METHODS FOR IMPROVING VIDEO CAMERA PERFORMANCE

Haim Melman, Hertzlia, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Nov. 27, 1984, Ser. No. 675,436
Int. Cl.[4] H05G *1/64;* H04N *5/32*
U.S. Cl. 358—111 **8 Claims**



1. A method for improving the performance of TV cameras used in digital subtraction angiography systems, said cameras having tubes comprising a target with elemental areas in said target corresponding to pixels of the image, said tube also having a focus coil for focusing the electron beam thereof onto the elemental areas of said target, said method comprising the steps of:

a. charging the target with an electron beam that scans the target during a preliminary charge scan period of said electron beam;

b. said electron beam being normally focused on a single target elemental area;

c. blanking said electron beam during a discharge period caused by an exposure pulse of radiation;

d. exposing said target elemental areas to photons generated by said radiation during said discharge period such that certain of said target elemental areas are discharged;

e. acquiring data by recharging said certain of said target elemental areas during a reading scan of a target area comprising a plurality of lines;

f. further recharging said target elemental areas in said target area during a scrub period prior to the next beam blanking period; and

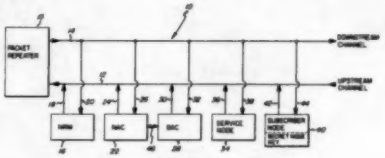
g. defocusing said electron beam during said scrub period to cause said electron beam to encompass a plurality of said elemental areas during said scrub period.

4,638,356

APPARATUS AND METHOD FOR RESTRICTING ACCESS TO A COMMUNICATION NETWORK

William A. Frezza, Warminster, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,384
Int. Cl.[4] H04N *7/00, 7/167;* H04K *1/02, 1/00*
U.S. Cl. 358—118 **15 Claims**



1. In a communication network having:

an upstream communication channel,

a downstream communication channel,

at least one service node for providing services to subscribers using the network,

at least one subscriber node including:

means for generating a frame verifier code, and

means for transmitting said frame verifier code on the upstream communication channel of said network, and

packet repeater means for receiving communications on said upstream communication channel and retransmitting the same on said downstream communication channel,

the improvement comprising:

access restricting apparatus including:

means coupled to said downstream channel for examining the frame verifier code from said subscriber node for validity; and

means for jamming said upstream channel if an invalid frame verifier code is detected by said examining means.

4,638,357

AUDIO SCRAMBLER

Paul A. Heimbach, New York, N.Y., assignor to Home Box Office, Inc., New York, N.Y.

Filed Jan. 20, 1984, Ser. No. 572,445
Int. Cl.[4] H04M *1/70;* H04N *7/67*
U.S. Cl. 358—121 **10 Claims**

1. A method for secure transmission of an audio signal, comprising the steps of:

generating a program audio signal;

generating an interference signal;

generating control information;

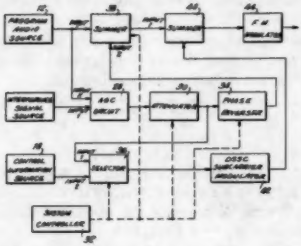
varying the level of said interference signal as a function of said program audio signal;

intermittently adding said interference signal to said program audio signal during predetermined periods of time to produce a scrambled signal;

transmitting said scrambled signal on one carrier;

simultaneously transmitting said interference signal on a second carrier; and

transmitting said control information on said second carrier during at least one interval between the predetermined



periods the interference signal is added to the program audio signal.

4,638,358

SAMPLING CLOCK REPRODUCING CIRCUIT

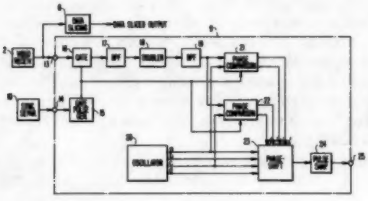
Toshiro Nozoe, Yamatokouriyama, and Akira Yamashita, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Jul. 19, 1983, Ser. No. 515,256

Claims priority, application Japan, Jul. 19, 1982, 57-126379; Jul. 19, 1982, 57-126380; Feb. 2, 1983, 58-16471

Int. Cl.⁴ H04N *5/04*

U.S. Cl. 358—147 **9 Claims**



1. A sampling clock reproducing circuit for teletext receiver comprising: a gate circuit for passing a clock-run-in signal included in a teletext signal; a first band-pass filter connected to said gate circuit and having a tuning frequency which is equal to a repeated frequency of said clock-run-in signal; a doubler circuit for doubling the frequency of an output signal of said band-pass filter; a second band-pass filter connected to said doubler circuit and having a tuning frequency which is about two times as large as the repeated frequency of said clock-run-in signal; an oscillator circuit oscillating at a frequency two times as large as the repeated frequency of said clock-run-in signal; phase comparison circuits each detecting a phase difference between a respective one of output signals of said oscillator circuit and an output signal of said second band-pass filter; and a phase-shift circuit which is given said output signals of said oscillator circuit and selectively mixes said output signals of said oscillator circuit with a changing mixing ratio therebetween in accordance with output signals of said phase comparison circuits, so that a sampling clock signal is reproduced from an output signal of said phase-shift circuit.

4,638,359

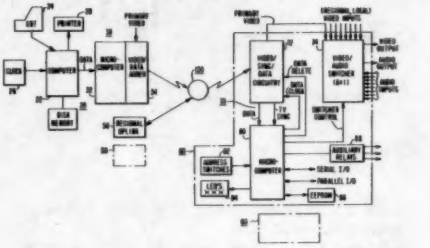
REMOTE CONTROL SWITCHING OF TELEVISION SOURCES

John N. Watson, Moorestown, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 496,030

Int. Cl.⁴ H04N *7/087*

U.S. Cl. 358—147 **7 Claims**



1. Apparatus for transmitting command and control information from a central television programming source to one or more remote local television subscriber systems via encoded signals combined with video signals of a video program comprising,

data generating means for developing binary command data messages,

computer means for converting the binary command data messages into a pulse width modulated waveform representing the binary command data message,

a shift register means having data and clock inputs operatively connected to said computer means said computer means loading said shift register means with a bit pattern that represents said pulse width modulated waveform, the number of shift register bits used to represent a particular data bit determining the width of the corresponding pulse in the waveform and hence its encoded value,

a high speed clock means for shifting said waveform out of said shift register means,

a sync detector circuit means for supplying sync information of said video signals to said computer means, said computer means responding to the vertical sync information by enabling said high speed clock means to shift said waveform from said shift register, and

adder means for inserting said pulse waveform output from said shift register means into the vertical blanking interval of the video signal of the video program for transmission to the remote local television subscriber system,

said pulse width modulated waveform consisting of narrow pulses and wide pulses, said computer means counting the logic zeros and logic ones in each binary command data message received from said data generating means and assigning the narrow pulses to represent the logic level which appears most often in the message and further including a mode bit in transmitted waveform to alert the local systems as to which pulse width corresponds to which logic level.

4,638,360

TIMING CORRECTION FOR A PICTURE-IN-PICTURE TELEVISION SYSTEM

Todd J. Christopher; Donald H. Willis, both of Indianapolis, and Russell T. Fling, Fishers, all of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 3, 1985, Ser. No. 771,700

Int. Cl.⁴ H04N *5/04, 5/262*

U.S. Cl. 358—148 **17 Claims**

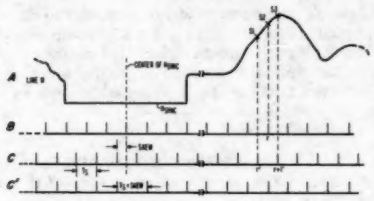
1. In a video signal processing system including a source of first video signal having a periodic horizontal line synchroniz-

ing signal component and a memory for holding sampled data representing a second video signal, apparatus for processing said sampled data in synchronism with said first video signal comprising:

means coupled to said source for developing horizontal synchronizing pulses representing the horizontal line synchronizing signal component of said first video signal:

a terminal for applying a clock pulse signal wherein the occurrence of clock pulses possibly exhibits varying amounts of skew relative to said horizontal synchronizing pulses;

skew measuring means coupled to said clock signal terminal



and responsive to said horizontal synchronizing pulses for generating a control signal corresponding to the difference in time, as a proper fraction of the period of said clock pulse signal, between the occurrence of a horizontal synchronizing pulse and a pulse of said clock signal;

means coupled to said clock signal terminal, for controlling the reading of the sampled data from said memory; and

skew correcting means coupled to said clock signal terminal, to said memory and to said skew measuring means for effecting a time displacement of the signal represented by the sampled data read from said memory, the magnitude of said time displacement being determined by said control signal.

4,638,361

SOLID STATE IMAGE PICKUP

Kaneyoshi Takeshita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

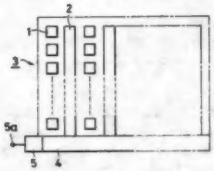
PCT No. PCT/JP82/00374, § 371 Date May 16, 1983, § 102(e) Date May 16, 1983, PCT Pub. No. WO83/01170, PCT Pub. Date Mar. 31, 1983

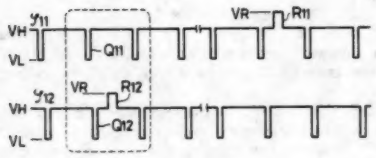
PCT Filed Sep. 17, 1982, Ser. No. 499,159

Claims priority, application Japan, Sep. 17, 1981, 56-146873

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213 **1 Claim**





1. A solid state image pickup apparatus employing a solid state image pickup device which comprises a plurality of photodetectors arranged horizontally and vertically, transfer gate areas each corresponding to each of the photodetectors, a plurality of vertical transfer portions comprising charge coupled devices each extending vertically and positioned contiguously to the transfer gate areas which have transfer areas and storage regions, and a horizontal transfer portion coupled with the end of each of the vertical transfer portions and an output portion, wherein a reading pulse voltage which takes a first high level is applied to an even numbered rows of transfer gates during even field periods and is applied to odd numbered rows of transfer gates during odd field periods, so that signal charges are read out from said storage regions of said vertical transfer portions, a voltage which takes a second high level which is lower than said first high level is applied to said storage regions of said vertical transfer portions during each horizontal video period, transfer pulse voltages which take a low level at respective different phases within each horizontal blanking period are applied to said vertical transfer portions, so that the signal charges which are read out to said vertical transfer portions are transferred vertically to said horizontal transfer portion, and the signal charges which have been transferred to the horizontal transfer portion are further transferred in the horizontal direction through the horizontal transfer portion to an output portion.

4,638,362

SOLID-STATE IMAGE PICKUP DEVICE

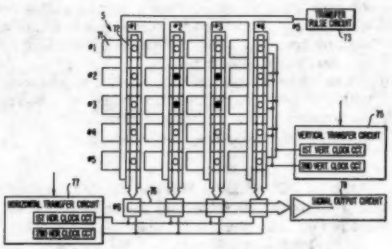
Mitsuaki Oshima, Moriguchi, and Kazufumi Yamaguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1984, Ser. No. 687,426

Claims priority, application Japan, Dec. 28, 1983, 58-250930

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213 **12 Claims**



1. A solid-state image pickup device comprising:

a photosensitive picture element unit comprising photosensitive picture elements arranged in a matrix in horizontal and vertical directions to convert light containing picture element information into electrical charges corresponding to individual picture elements through photoelectric conversion;

a horizontal charge transfer means which transfers said electrical charges corresponding to individual picture elements in the horizontal direction; and

a vertical charge transfer means which transfers said electrical charges corresponding to individual picture elements in the vertical direction;

wherein at least one of said vertical charge transfer means and said horizontal charge transfer means is controlled in response to external control signals so that a part of said electrical charges corresponding to individual picture elemenfs in a specified part of said photosensitive picture elements are outputted as picture element output signals; and

wherein said horizontal charge transfer means has a plurality

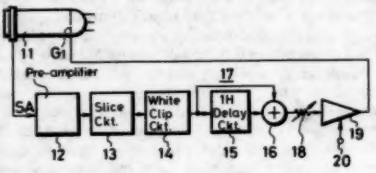
of output takeout outlets which are selectively actuated according to said external control signals.

4,638,363

AUTOMATIC BEAM CURRENT CONTROL SYSTEM FOR TELEVISION CAMERA

Sadaaki Tanaka, and Hisashi Ushijima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,820
Claims priority, application Japan, Nov. 22, 1984, 59-247738
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—219 **7 Claims**



1. An automatic beam current control system for a television camera in which a beam current is detected from a target electrode of a camera tube and a beam current control signal is supplied to a beam current control electrode of the camera tube to thereby control the beam current comprising:

(a) beam current detecting means for detecting a beam current from a target current delivered from said target electrode of said camera tube;

(b) wave reshape means connected to said beam current detecting means for reshaping a waveform by a non-linear circuit;

(c) line adder means connected to said wave reshape means for generating a beam current control signal derived by adding a signal obtained by scanning a first line with an electron beam and a signal obtained by scanning a second line near said first line; and

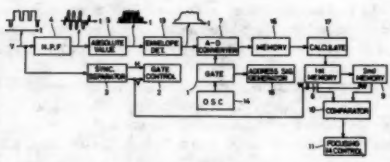
(d) beam current control electrode drive means supplied with said beam current control signal for generating an electron beam of a predetermined intensity.

4,638,364

AUTO FOCUS CIRCUIT FOR VIDEO CAMERA

Tatsuo Hiramatsu, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Oct. 28, 1985, Ser. No. 791,843
Claims priority, application Japan, Oct. 30, 1984, 59-228308
Int. Cl.[4] H04N *5/232*
U.S. Cl. 358—227 **9 Claims**



1. An auto focus circuit for a video camera including a focusing motor for focusing, comprising:

a high-pass filter circuit to which a luminance signal of a video signal is applied so that a high frequency component higher than a predetermined frequency is extracted from said applied luminance signal,

an absolute value calculating circuit connected to said high-pass filter circuit for obtaining an absolute value of the output of said high-pass filter circuit, an A-D converting circuit connected to said absolute value calculating circuit for converting an analog absolute value output signal provided from said absolute value calculating circuit to a digital signal,

a calculating circuit connected to said A-D converting circuit for adding the converted digital signal with a predetermined period cycle,

a comparing circuit connected to said calculating circuit for comparing the output of calculation in one predetermined period and the output of calculation in the predetermined period coming one predetermined period ahead of said predetermined period, and

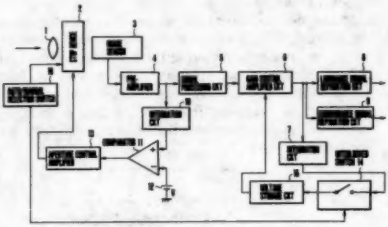
a focusing motor control circuit connected to said comparing circuit for providing a signal for controlling the rotation of the focusing motor included in said video camera in the clockwise direction or in the counterclockwise direction based on the output of said comparing circuit.

4,638,365

IMAGE SENSING DEVICE

Tokuzo Kato, Chiba, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,559
Claims priority, application Japan, Jan. 31, 1984, 59-15819
Int. Cl.[4] H04N *5/26*
U.S. Cl. 358—228 **31 Claims**



1. An image sensing device comprising:

(a) image sensing means for sensing an optical image;

(b) exposure control means for controlling light incident on said image sensing means;

(c) gain control means for automatically controlling the gain of a signal produced from said image sensing means;

(d) an operation member for a manual operation on said exposure control means; and

(e) memory means for holding the gain of said gain control means when the operation member operates.

4,638,366

AUTOMATIC IRIS ADJUSTMENT SYSTEM

Yasuo Yoshimura, Hachioji; Kunio Yamauchi, and Kenji Saito, both of Kodaira, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,793
Claims priority, application Japan, Sep. 28, 1984, 59-145860[U]
Int. Cl.[4] H04N *5/238*
U.S. Cl. 358—228 **4 Claims**

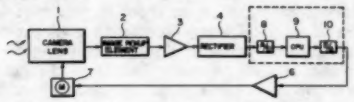
1. An automatic iris adjustment system comprising:

a camera lens including an iris driving means for controlling the iris value;

an image pickup element for converting the amount of light incident to said camera lens into an electrical signal;

calculation means which compares the iris adjustment signal voltage V_I provided by said image pickup element with a reference voltage V_O to evaluate an error voltage V_E (i.e., $V_E = V_I - V_O$);

calculation means which evaluates a varying component ΔIRIS of iris control value as a predetermined function of the error voltage V_E;



calculation means which evaluates an iris control value $IRIS_n$ basing on the calculated varying component ΔIRIS of iris control value; and

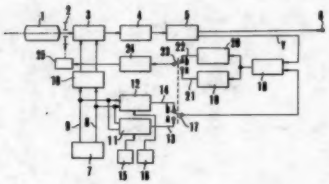
means for controlling said iris driving means in response to the calculated iris control value $IRIS_n$.

4,638,367

LIGHT METERING AND PROCESSING SYSTEM PARTICULARLY FOR A VIDEO CAMERA

Toshio Sakane, and Tokuichi Tsunekawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 238,685, Feb. 27, 1981, abandoned.
This application Feb. 6, 1985, Ser. No. 698,749
Claims priority, application Japan, Feb. 27, 1980, 55-23696
Int. Cl.[4] G03B 7/00
U.S. Cl. 358—228 **37 Claims**



1. An optical measuring device comprising:

(a) image pick-up means for converting an optical image into electrical image information;

(b) reading means for time-serially reading out the electrical image information converted in the image pick-up means;

(c) operating means for applying a predetermined function signal to the electrical image information read out of the image pick-up means by the reading means thereby forming ouputs;

(d) adjusting means for changing the time correlation between the function signal and the time-serial electrical image information read out of the image pick-up means; and

(e) averaging means for averaging the outputs of the operating means.

4,638,368

REPRODUCTION APPARATUS

Katsuichi Shimizu, Kunitachi; Shunichi Masuda, Tokyo; Toshiaki Yagasaki, Hino, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 278,563, Jun. 29, 1981, abandoned.
This application Sep. 21, 1984, Ser. No. 653,072
Claims priority, application Japan, Jun. 30, 1980, 55-88722; Jun. 30, 1980, 55-88723
Int. Cl.[4] H04N 1/00
U.S. Cl. 358—256 **10 Claims**

1. An image processing system, comprising:

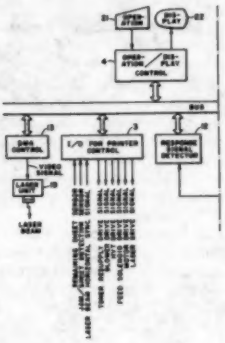
means for reading an original image by photoelectric conversion and for generating original imaga data in bit image form;

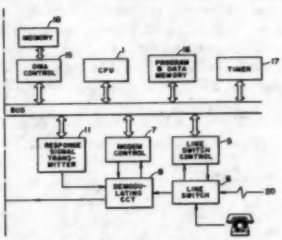
means for entering character code data representing a character image;

means for converting the character code data entered by said entering means into character image data in bit image form;

first memory means for storing a page of image data in bit image form;

means for causing said first memory means to store the original image data and the character image data;





means for forming on a recording medium a reproduction image based on the image data read out from said first memory means, wherein in the reproduction image the character image has been inserted in the original image;

second memory means for storing bit image data corresponding to the image data stored in said first memory means; and

means for displaying an image based on the bit image data stored in said second memory means.

4,638,369

EDGE EXTRACTION TECHNIQUE

Robert C. Hsieh, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 4, 1984, Ser. No. 646,878
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—283 **4 Claims**

1. A method of producing an enhancement value for enhancing the edges of a halftone copy of a halftone original comprising the steps of:

scanning the original to produce a one bit per pixel raster,

isolating an m bit by m bit segment of the raster, where m is an odd number, and the N bit is the center bit,

calculating an edge sharpness value of the horizontal edges directly above and below the N bit,

calculating an edge sharpness value of the vertical edges directly to the left and right of the N bit,

for each direction, finding a most positive and a most nega-

tive sharpness value from the two sharpness values and zero,

taking the root mean square of the two most positive values, and of the two most negative values, to create positive and negative enhancement values,

testing the enhancement values by dividing their difference by the larger of the two, and comparing the absolute value of the result of said division to a first threshold,

using the positive enhancement value as the enhancement value if N is a "1" and the first threshold was not exceeded,

using the negative of the negative enhancement value as the enhancement value if N is a "0" and the first threshold was not exceeded,

using the positive enhancement value as the enhancement value if the positive value is larger than the negative value, and if the first threshold was exceeded,

selecting the negative of the negative enhancement value as the enhancement value if the negative value is larger than the positive value, and if the first threshold was exceeded,

testing the absolute value of the selected enhancement value against a second threshold,

adding the selected enhancement value to the sum of the "1" bits in said m by m bit segment to create an edge enhanced gray scale pixel if the second threshold is exceeded, or adding nothing to said sum if the second threshold is not exceeded.

4,638,370

APPARATUS FOR DIGITALIZING AN IMAGE BY ANALYSIS BY MEANS OF A LIGHT BEAM

Jean-Claude Rosier; Claûde Fouche, both of Gasny, and Gabriel Maincent, Tourny, all of France, assignors to Societe Europeenne de Propulsion, France

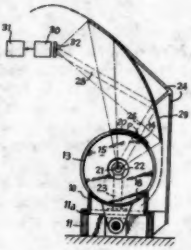
PCT No. PCT/FR84/00191, § 371 Date Apr. 22, 1985, § 102(e) Date Apr. 22, 1985, PCT Pub. No. WO85/01170, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 23, 1984, Ser. No. 725,743

Claims priority, application France, Aug. 24, 1983, 83 13663

Int. Cl.⁴ H04N *1/06*

U.S. Cl. 358—293 **4 Claims**



1. An apparatus for digitalizing an image carried by a transparent medium, comprising:

(a) a transparent analysis cradle shaped as a portion of a cylinder for receiving a transparent medium carrying an image to be digitalized;

(b) light source means;

(c) a first optical device for projecting a light beam emitted from the light source means onto an image carried by a medium fixed on the analysis cradle, said first optical device comprising a mirror which is rotatable about an axis aligned with that of the analysis cradle and which is oriented for receiving said light beam and reflecting said light beam perpendicularly to the surface of the analysis cradle;

(d) means for rotating the mirror about said axis;

(e) a second optical device comprising optico-electrical means hving a photosensitive surface to convert light received by said photosensitive surface into an electrical signal, and an elliptic mirror with a reflecting surface situated on a portion of a surface of a cylinder having an ellipse as a base and having an axis parallel to the axis of the analysis cradle, the center of the rotatable mirror and the center of the photosensitive surface being respectively substantially located at the focal points of the elliptic mirror, said elliptic mirror receiving the light beams which have gone through the analysis cradle and an image carrying medium fixed thereon as the rotatable mirror is rotated to scan one image line, and said elliptic mirror reflecting the received light beam onto the photosensitive surface so as to convert successive image elements of said image line into respective electrical signals;

(f) means for digitalizing said electrical signals; and

(g) means for moving the analysis cradle in translation with respect to the rotatable mirror and second optical device so that an image carrying medium fixed on the analysis cradle is scanned line by line.

4,638,371

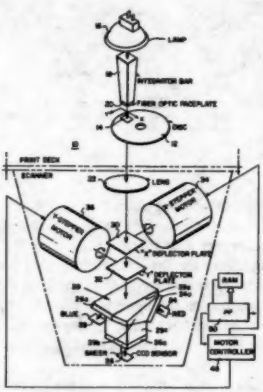
MULTIPLE EXPOSURE OF AREA IMAGE SENSOR HAVING A SPARSE ARRAY OF ELEMENTS

James R. Milch, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,206

Int. Cl.⁴ H04N *1/10, 3/06, 5/30, 9/04*

U.S. Cl. 358—293 **2 Claims**



1. Image scanning apparatus comprising an area sensor including a sparse array of sensor elements which are exposed by pixels of a light image, said pixels of said light image being effectively the same size as said sensor elements, such that at a given relative position between said sensor and said light image, nearest-neighbor sensor elements of the array are exposed by non-neighboring pixels of the light image, means responsive to said exposed sensor elements to produce a digital image and means for moving the light image relative to the sensor to produce successive exposures of each sensor element by different light image pixels which have not previously exposed a sensor element, said moving means being adapted to move the light image relative to the sensor in such a pattern that digital image pixels of the digital image produced by individual sensor elements have nearest-neighbor digital image pixels produced by different sensor elements, and means coupled to the sensor and responsive to the successive exposures of the sensor elements for forming a digital image having rows and columns of digital image pixels, wherein the successive exposures of each sensor element produce digital image pixels in at least three

different columns and three different rows of said digital image.

4,638,372

COLOR COPIER

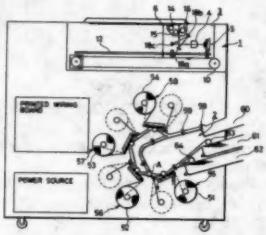
Svay Leng; Hiroyuki Saitoh; Toshiharu Inui; Norihiko Koizumi; Haruhiko Moriguchi; Takashi Omori; Masami Kurata, and Yasuo Katoh, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,403

Claims priority, application Japan, Oct. 17, 1983, 58-192531

Int. Cl.[4] H04N *1/21, 1/23, 1/46*

U.S. Cl. 358—296 **11 Claims**



1. A color copier, comprising a platen for mounting thereon a manuscript to be copied, a scanner unit adapted to reciprocate relative to said platen and generate image signals divided into three primary colors by reading said manuscript for each line or for each set of a plurality of lines, feed means for feeding cut recording sheets, a paper transfer route for transferring recording sheets fed out of said feed means, a first thermal head for feeding image signals in black disposed on said paper transfer route most closely to said feed means, second, third, and fourth thermal heads for feeding image signals in three colors other than black disposed sequentially on a downstream side relative to said first thermal head, paper transfer route switch means disposed in said paper transfer route between said first thermal head and said second thermal head, a by-pass paper transfer route formed between said paper transfer route switch means and a downstream side of said fourth thermal head, means for feeding ink donor sheets in black and in three colors other than black respectively to said thermal heads, first tightly pressing means for tightly pressing said recording sheet against said first thermal head through a medium of said ink donor sheet in black, first peel means for separating said recording paper from said ink donor sheet in black after completion of thermal transfer recording by said first thermal head, second, third, and fourth tightly pressing means and peel means similar to said first tightly pressing means and peel means, and paper discharge means for discharging said recording sheet separated by said first or fourth peel means, which color copier is characterized by the fact that for recording not in colors, said recording paper is separated by said first peel means and then guided by said paper transfer route switch means to said by-pass paper transfer route not passing said second, third and fourth thermal heads.

4,638,373

METHOD AND APPARATUS FOR IMPROVING GRAY SCALE RESOLUTION IN AN INK JET PRINTING SYSTEM

David J. Logan, Glastonbury, Conn., assignor to Metromedia, Inc., Secaucus, N.J.

Filed Mar. 6, 1985, Ser. No. 708,744

Int. Cl.[4] H04N *1/21;* **G01D** *9/00, 15/16*

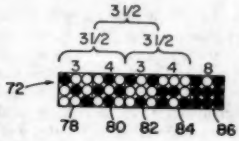
U.S. Cl. 358—298 **4 Claims**

1. A method for increasing the gray scale resolution of a graphic generated by an ink jet printing system, said ink jet printing system including ink jet printing means and means for controlling and operating said ink jet printing means to apply or not apply substantially equal sized dots of one color to a plurality of pixel areas located sequentially along a line scanned by said printing means and within each of which pixel areas, potential dot positions form an array identical for all pixel areas, said method comprising the steps of:

producing a sequential series of image density signals each substantially representative of the gray scale color intensity level associated with a respective one of said pixel areas;

converting said gray scale color intensity level value to an equivalent dot level value for each of said pixel areas;

comparing the dot level value associated with each of said pixel areas to a plurality of sets of dot level values, at least one set comprising integer dot level values and another set including dot level values other than integer values, each of said integer values corresponding to one of N integral color intensity values that may be represented by printing dots in said pixel dot position array;



identifying adjacent side-by-side pixel areas having dot level values corresponding to values in said another set wherein said identified pixel areas have dot level values falling between the same two successive integer values;

alternately adding one and another of a predetermined dot level value to the dot level value associated with those identified adjacent side-by-side pixel areas having dot level values between two successive integers so that the dot level value of one of the two adjacent pixel areas is increased by said one predetermined dot level value and the other is decreased by said another predetermined dot level value;

rounding off each of the increased and decreased pixel dot level values to the nearest integer value so that the resulting dot level value of one of the two pixels is one dot level value more than the dot level value of the other pixel, and

printing each of said two pixels in accordance with the resulting dot level value determined such that the average of the sum of the dot level values of the two printed pixels more nearly approximates the gray scale value corresponding to the associated image density signal.

4,638,374

DEFECT DETECTING APPARATUS FOR A ROTARY RECORDING MEDIUM

Yuji Yoshitake, Fujisawa; Kentaro Yokouchi, Yokosuka, and Hiroyoshi Yoshikawa, Zama, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jun. 14, 1984, Ser. No. 620,803

Claims priority, application Japan, Jun. 16, 1983, 58-108882

Int. Cl.[4] H04N *5/781, 5/94*

U.S. Cl. 358—336 **6 Claims**

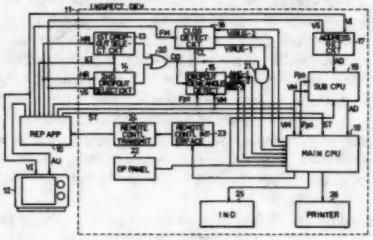
1. A defect detecting apparatus for detecting defects of a rotary recording medium based on various signals received from a reproducing apparatus which plays the rotary recording medium, said rotary recording medium having a frequency modulated multiplexed signal pre-recorded on a spiral track or concentric tracks thereof, said frequency modulated multiplexed signal being a multiplexed signal which has an address signal indicative of track positions multiplexed to information signals at least including a composite video signal, and which

has been subjected to a frequency modulation, said defect detecting apparatus comprising:

a first dropout selecting circuit supplied with a dropout detection signal which is produced from said reproducing apparatus when a decrease in the amplitude of a signal reproduced from the rotary recording medium is detected in said reproducing apparatus, for producing a first dropout detection signal having a predetermined pulse width responsive to one or a plurality of the dropout detection signals which are received from said reproducing apparatus during a predetermined duration in which a plurality of dropouts may be visually considered as being one dropout;

a second dropout selecting circuit supplied with the dropout detection signal and a reproduced vertical synchronizing signal from said reproducing apparatus, for producing a second dropout detection signal responsive to the dropout detection signal which is received from said reproducing apparatus with a phase which is at least in a vicinity of a beginning of the reproduced vertical synchronizing signal;

an angle detecting circuit supplied with a reference signal which is reproduced by said reproducing apparatus with a period of one track turn and the first and second dropout detection signals received from the respective first and second dropout selecting circuits, for generating an angle detection signal indicative of angular positions on the rotary recording medium where the first and second dropout detection signals are generated with respect to a reference position which is related to the reference signal;



a clog detecting circuit supplied with the frequency modulated multiplexed signal which is reproduced from the rotary recording medium in said reproducing apparatus and a clock signal having a constant frequency, for detecting at least a dropout which is caused by a clog on the rotary recording medium and has a duration of over a predetermined duration, and for generating a clog detection signal having a duration corresponding to the detected dropout;

compensating means for compensating a value of the address signal which is detected and reproduced from the frequency modulated multiplexed signal which is reproduced from the rotary recording medium in said reproducing apparatus, by comparing the value of the address signal which is detected and reproduced with a value of the address signal which was previously detected and reproduced;

processing means for sequentially performing a first process in which the existence of a tracking error is discriminated by comparing the value of the reproduced address signal from said compensating means and real time, a second process in which the existence of a clog is discriminated responsive to the clog detection signal from said clog detecting circuit, and a third process in which at least the existence of an interval in which a dropout is generated is discriminated based on the angle detection signal from said angle detecting circuit and the first and second dropout detection signals from the respective first and second dropout selecting circuits; and

at least an output device for storing or displaying a result of the processing in said processing means.

4,638,375

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

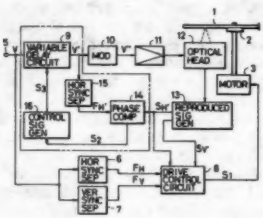
Tadashi Motoyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,572

Claims priority, application Japan, May 25, 1983, 58-92139; May 25, 1983, 58-92140

Int. Cl.[4] H04N *5/76*; G11B *21/10*

U.S. Cl. 358—338 **8 Claims**



1. Apparatus for recording and reproducing a video signal on a disc which is subject to an eccentricity capable of causing a phase error in said signal and which is provided with a record track formed thereon and for reproducing a video signal from the record track on the disc; said apparatus comprising:

a head assembly containing recording and reading portions;

disc rotating meand for driving the disc to rotate in relation to said head assembly;

input terminal means for receiving said video signal;

signal path means extending from said input terminal means to the recording portion;

first control circuit means for receiving at least a first reference signal reproduce from the disc through the reading portion and a first synchronous signal in the video signal supplied to said input terminal, and controlling said disc rotating means so as to vary the rotation thereof in response to the phase of said first synchronous signal;

variable delay means provided in said signal path for delaying the video signal supplied to said input terminal to vary the time base thereof; and

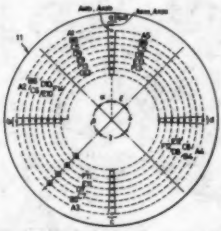
second control circuit means for receiving a second reference signal reproduced from the disc through the reading portion and a second synchronous signal in the video signal in said signal path, and controlling the delay time in said variable delay means so as to cause the time base of the video signal derived from said variable delay means to vary in response to the phase of said second reference signal in such a manner as substantially to elminate said phase error due to said eccentricity.

4,638,376

ROTARY RECORDING MEDIUM WHICH IS PLAYABLE IN STILL PICTURE, SLOW-MOTION AND NORMAL REPRODUCTION MODES

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abè, both of Yokohama; Kenji Yoshihara, Chiba, and Yasuo Haneji, Kanagawa, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 433,872, Oct. 13, 1982, abandoned.
This application Jan. 10, 1986, Ser. No. 818,057
Claims priority, application Japan, Oct. 14, 1981, 56-163999; Oct. 14, 1981, 56-164000; Oct. 14, 1981, 56-164001; Oct. 14, 1981, 56-164002; Oct. 14, 1981, 56-164003
Int. Cl.[4] H04N 5/76
U.S. Cl. 358—342 8 Claims



1. A rotary recording medium which is playable in still-picture, slow-motion and normal reproduction modes on a reproducing apparatus which comprises a reproducing element for reproducing signals from the rotary recording medium, said rotary recording medium comprising:

at least one recording surface;

a spiral track formed on said recording surface, said spiral track being made up of a plurality of track turns;

a first video signal related to a unit which is repeatedly recorded with N field periods in each of said track turns, where N is a natural number which is greater than one, said unit being equal to one picture of a movie film;

a track shift address signal recorded in at least one position in each of said track turns with a constant period regardless of whether said unit is one field of the second video signal or one picture of the movie film, said track shift address signal comprising a rotary recording medium discriminating code for indicating a specific track pattern recorded on said rotary recording medium which comprises as recorded signals the first video signal related to the unit which is repeatedly recorded with N field periods in each of said track turns, a kick existence instructing code for indicating the existence of a forced track shift of the reproducing element from one track turn to another track turn, and a kick direction instructing code for indicating the direction of the forced track shift; and

divided audio signal segments successively arranged and recorded in accordance with a scanning locus of the reproducing element in the normal reproduction mode of the reproducing apparatus, said divided audio signal segments being obtained by segments of an audio signal,

said rotary recording medium having track parts with said divided audio signal segments recorded on at least a part of said recording surface,

said first video signal being repeatedly recorded for four field periods in each of said track turns, each of said track turns comprising first through fourth vertical blanking period recorded parts (a, b, c, d), each of said parts being recorded with a vertical blanking period of said first video signal, each of said track turns starting from said first vertical blanking period recorded part (a), an (M+1)-th divided audio signal segment out of said divided audio signal segments extending for eight fields of said first video signal from an intermediate point between said second and third vertical blanking period recorded parts (b, c) on a (2M+2)-th track turn, where M is a natural number including zero, said (M+1)-th divided audio signal segment containing an audio information in a first half part thereof which extends over four fields of said first video signal, said audio information being indentical to an audio information which is contained in a latter half part of an M-th divided audio signal segment, said latter half part of said M-th divided audio signal segment extending over four fields of said first video signal,

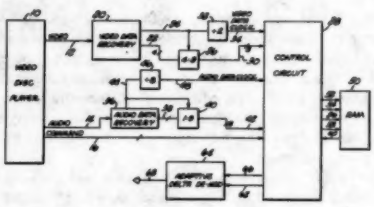
said kick existence instructing code and said kick direction instructing code of said track shift address signal having values such that the forced track shift of the reproducing element in the normal reproduction mode occurs in a (2M+1)-th track turn within said third vertical blanking period recorded part (c) in the inner peripheral direction of said rotary recording medium, so that a normal reproduction picture is obtained together with a continuously reproduced audio signal in response to a 2-2 pull-down performed in the reproducing apparatus, a still picture being obtainable in the still picture reproduction mode when the forced track shift of the reproducing element occurs within said first vertical blanking period recorded part in the outer peripheral direction of said rotary recording medium so as to repeatedly reproduce the same track turn.

4,638,377

SELECTABLE VIDEO/AUDIO CODED DATA RECOVERY FROM A RECORD MEDIUM

Wayne R. Dakin, Huntington Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 342,292, Jan. 25, 1982, abandoned. This application Sep. 6, 1984, Ser. No. 647,779
Int. Cl.[4] H04N 5/76, 5/78; G11B 7/00
U.S. Cl. 358—343 8 Claims



1. Apparatus for recovering an audio message from a selected one of a plurality of blocks of composite digital audio data recorded on a record medium as at least one video encoded digital audio data block and at least one audio encoded digital audio data block, each said data block comprising a series of digitally encoded audio message units, each said audio message unit comprising a message portion, said apparatus comprising:

player means for recovering said blocks of composite digital data from said record medium, and including means capable of outputting recovered video encoded digital audio data blocks, means capable of outputting recovered audio encoded digital audio data blocks, and means for outputting command data;

selector means coupled to said player means and receiving any recovered video encoded data blocks and any recovered audio encoded data blocks of composite digital audio data, and including data select means responsive to said command data for selecting and outputting one of said recovered video and audio encoded data blocks of composite digital audio data;

addressable data storage means;

write means for receiving said selected block of composite digital audio data from said data select means, and for

writing said selected block of composite digital audio data into predetermined data storage locations in said addressable storage means; and

data readout means responsive to said command data for reading out of said addressable storage means the message portion of a selected audio message unit.

4,638,378

FIDELITY CONTROL DURING OPERATION OF DUPLICATOR MACHINES

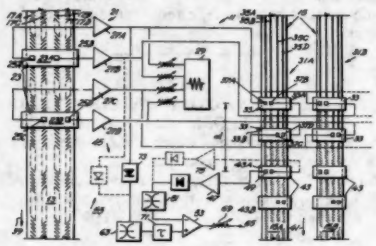
Arrigo Zanessi, Montevideo 215, 5500 Mendoza, Argentina

Filed Jun. 12, 1985, Ser. No. 743,778

Claims priority, application Argentina, Jun. 12, 1984, 296890

Int. Cl.[4] G11B *5/02, 5/09, 5/86, 27/36*

U.S. Cl. 360—15 **3 Claims**



1. A fidelity monitor apparatus for use with a high-speed recorder machine which has reader means for reproducing a master signal from a master source and producing an output signal indicative thereof, and recorder means including at least one recorder head for recording, at a substantially higher than normal rate, said output signal on each track of a slave means which has at least one moving track, said fidelity monitor apparatus comprising:

slave monitor means including at least one pick-up head spaced a predetermined distance downtrack from each recorder head, for obtaining a slave sample of said master signal just recorded on said moving track by said recorder head;

electronic means connected to said output signal of said reader means for electronically deriving a master reference which is in phase with said slave sample from said output signal, said electronic means including means for producing a master sample from said master signal as soon as said master signal is read at said higher than normal rate from said master source, said produced master sample being in a lower frequency range than that of said master signal;

comparator means for generating a malfunction signal when said slave sample differs from said master reference in more than a predetermined manner; and

werein said electronic means further includes delay means, connected between said producing means and said comparator means, for delaying said master sample to enphase said master sample with said slave sample to obtain said master reference, wherein said delay device is selected to operate in said lower frequency range and to provide a time-delay substantially equal to a quotient of said predetermined distance divided by a speed of said moving track relative to slave pick-up and said recorder heads.

4,638,379

TRACKING CONTROL SYSTEM FOR A VIDEO TAPE RECORDER

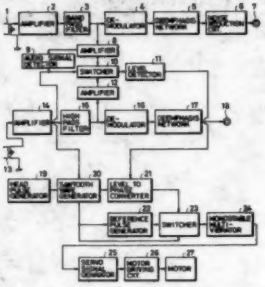
Tsunehiko Teshima, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,962

Claims priority, application Japan, Jul. 27, 1984, 59-155297

Int. Cl.[4] H04N *5/78, 5/76;* **G11B** *5/45*

U.S. Cl. 360—19.1 **5 Claims**



1. A tracking control system for a VTR having a rotary head which is composed of a rotatable drum, at least one audio head for recording and reproducing an audio FM signal, and at least one video head for recording and reproducing a video FM signal, both heads being mounted on a circumference of the rotatable drum with a predetermined distance from each other, said system comprising;

a detector for detecting the existence of the audio FM signal reproduced by the audio head;

a level detector for detecting a level of a signal applied thereto and producing an output an amplitude of which is proportional to the level of the signal applied thereto;

a switching circuit for selectively supplying the level detector with the audio FM signal reproduced by the audio head when the audio FM signal exists and with the video FM signal reproduced by the video head when the audio FM signal does not exist, in response to an output of the detector for detecting the existence of the audio FM signal; and

means for controlling a tracking position of the rotary head on the basis of the output of the level detector so as to make the output of the level detector maximum.

4,638,380

DIGITAL VIDEO TAPE RECORDER APPARATUS

James H. Wilkinson, and Clive H. Gillard, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,516

Claims priority, application United Kingdom, May 19, 1983, 8313821

Int. Cl.[4] G11B *5/02;* **H04N** *5/78*

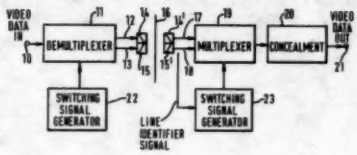
U.S. Cl. 360—22 **9 Claims**

1. Digital video tape recorder apparatus comprising:

a recording head assembly having 2n heads, where n is an integer;

a demultiplexer responsive to an incoming digital video signal organized in a plurality of video lines, each line being formed of a plurality of video samples, for demultiplexing said video signal sample by sample into 2n channels for supply to said 2n recording heads; and

switching means for switching the connections between said channels and said heads line-by-line of said television



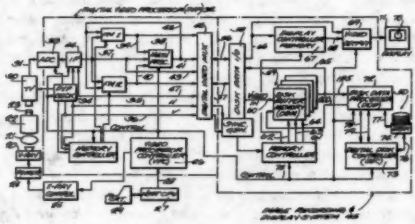
signal, so that said connections are different from one line to the next.

4,638,381

STORAGE OF DIGITIZED VIDEO IMAGES ON DISK

Steven T. Vaughn, Wales, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1984, Ser. No. 637,873
Int. Cl.[4] G11B *5/09, 5/43*
U.S. Cl. 360—51 **2 Claims**



1. A digital data deskewing circuit for use with a parallel transfer digital disk drive having a plurality of coaxially arranged magnetic disks rotating together at a constant speed, a plurality of digital data transmission channels and read/write heads magnetically coupling the channels to the disks, respectively, a master clock controlling writing on the respective disks a number of digital words, bytes or other digital data bit groups, said groups being written on each disk as a serial stream of bits, during reading of the streams from the disks said drive providing a bit read clock pulse train for each channel for defining the bits and a sync data bit grouping derived from the disk and preceding valid digital data, said clock pulses sometimes being out of synchronism with each other such that the data bits are skewed in time relative to each other during readout of the disks, said disk drive issuing an index pulse for each disk revolution sectors pulses marking each disk sector,

deskewing circuit means comprising master sequencer means referenced to the index and sector time base of the disk drive and operative to provide clock pulse signals for serial bit stream outputs from all channels at the same time,

each channel including serial-to-parallel converter means having a data input for serial bits from a disk and an input for said bit read clock of the channel, said converter having a predetermined number of parallel bit outputs,

sync detector means coupled to said parallel bit outputs of said converter means, detection of said sync data indicating that serial bits composing valid data follow,

digital latch means having parallel bit inputs coupled to the respective parallel bit outputs of said converter means and having corresponding outputs and a clock pulse input which clock rate is a fraction of the bit read clock rate to said serial-to-parallel converter, so that for every latch means clock said predetermined number of bits will be transferred from said converter to said latch means,

first-in, first-out (FIFO) memory means having parallel bit inputs coupled to corresponding outputs of said latch means, having corresponding parallel bit outputs and having an input clock that is such fraction of said read clock rate and having an output clock supplied by said master sequencer means for controlling the rate at which parallel bits are transferred together out of said FIFO memory means,

parallel-to-serial converter means having parallel bit inputs coupled to corresponding outputs of said FIFO memory means and having a bit rate output control clock supplied by said master sequencer and having an output for serially arranged bits, and

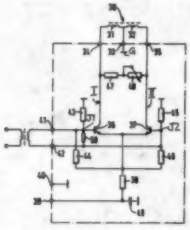
another sequencer means with its input coupled to said sync detector means and responding to detection of said sync data by initiating control and clocking of said latch means and FIFO memory means to transfer said predetermined number of parallel bits per clock pulse.

4,638,382

PUSH-PULL AMPLIFIER AND METHOD FOR OPERATION, PARTICULARLY RECORDING AMPLIFIER FOR VIDEO TAPE RECORDERS

Josef Sochor, Dieburg, Fed. Rep. of Germany, assignor to Robert Josch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,845
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326066
Int. Cl.[4] G11B *5/02*
U.S. Cl. 360—68 **10 Claims**



1. A video head wheel-recording transducer-recording amplifier combination having

a rotatable head wheel (1);

at least one transducer head (6, 7, 8, 9), each having a transducer coil (30, 109, L_K) and end terminals (34, 35; 107, 108) located on the rotating head wheel;

a plurality of rotating electrical transmission elements (11) on the head wheel, forming part of electrical transfer paths for transferring electrical energy between the rotating head wheel and stationary components;

and at least one push-pull transistor amplifier located on the rotatable head wheel,

wherein the transistor push-pull amplifier comprises

a push-pull amplifier circuit which has a minimum number of electrical transfer paths between the rotating head wheel on the stationary component and is characterized by a circuit configuration which determines the operating point of the transistors of the transistor amplifier by control of the voltage of a power source, coupling power via power connection sections of the electrical transfer paths to the transistor push-pull amplifier,

said transistor push-pull amplifier circuit comprising

two branches (I, II; I', II') each including a transistor (36, 37; 101, 102, 103, 104) of identical conductivity type;

a common resistor (38, 118) having a first and a second terminal,

the emitters of both transistors of the two branches (I, II) being connected together and to the first terminal of said common resistor only, and the second terminal of the common resistor being connected to one terminal (39, 119) of the power connection section of the transfer paths;

two resistor circuits, each having at least two resistors (43, 44, 45, 46; 112, 113, 116, 117), and a common junction or tap point (J1, J2, J1', J2'; J3, J4) connecting said at least two resistors of the two resistor series circuits,

each resistor series circuit having one end terminal connected to the other terminal (40, 110) of the power connection section transfer paths including the head wheel, and another end terminal connected to said one terminal of the common resistor (39, 118) and hence to the emitters of the transistors (36, 37; 101, 102, 103, 104) of the two branches (I, II; I', II');

a connection between the junctions or tap points of each of the resistor series circuits of a transistor in a respective branch (I, II; I', II'); and

wherein the end terminals (34, 35; 107, 108) of the transducer coil are coupled to respective collectors of the transistors in the respective branches.

4,638,383

MICRO HARD-DISK DRIVE SYSTEM

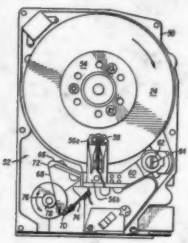
James G. McGinlay, 103 Ralston Drive, Kirkcaldy, Scotland, and Roderick M. Urquhart, 10 Balgeddie Way, Glenrothes, Scotland

Continuation of Ser. No. 582,554, Feb. 22, 1984, Pat. No. 4,568,988. This application Nov. 19, 1985, Ser. No. 790,621

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

Int. Cl.[4] G11B *5/012, 5/55, 5/56*

U.S. Cl. 360—77 **16 Claims**



1. A computer disk drive system for operating a micro hard-disk, said disk drive system comprising:

at least one micro hard-disk having a diameter of between 92 and 96 millimeters fixedly mounted in a sealed housing;

means for rotatably supporting said hard-disk;

means for rotating said hard-disk;

transducer means having two read/write heads for writing digital information on and reading digital information from said hard-disk on both planar sides of said hard-disk in a format so that said hard-disk has digital information stored on concentric tracks at a density providing at least 5 Megabytes of storage per disk; and,

positioning means for moving said transducer means between the tracks on said hard-disk, said positioning means being arranged to substantially limit the total variance of the angle of said transducer means to a line tangential to each of said concentric tracks, said positioning means including a stepper motor and means for operating said stepper motor in step increments, each increment causing said transducer means to move from one track to the next adjacent track on said hard-disk.

4,638,384

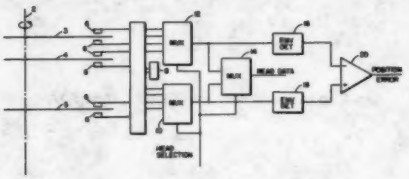
HEAD POSITIONING MECHANISM FOR ROTATING DISK DATA STORAGE SYSTEM

Alexander Stewart; Duncan S. Furness, and Sham P. Bhatia, all of Boca Raton, Fla., assignors to Rodime, PLC, Scotland

Filed Nov. 19, 1985, Ser. No. 799,595

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—77 **20 Claims**



1. A fine position closed loop servo system for use in conjunction with a closed loop servo positioning system for a magnetic disk storage media having at least two data storage disks rotatingly driven at a constant velocity with a plurality of concentric data tracks on at least one of the surfaces of each of said data storage disks, at least one data transducer associated with and in close proximity to each of said data storage disks, said data transducers being mounted to a common head mounting structure for movement by driver means across said plurality of concentric tracks on each of said at least two data storage disks, comprising:

first servo burst signals on a surface of a first of said at least two data storage disks, said first servo burst signals being recorded on said first data storage disk at radial positions one-half track displaced from one of the odd and even numbered concentric track centerlines;

second servo burst signals on a surface of another of said at least two data storage disks, said second servo burst signals being recorded at radial positions one-half track displaced from the not already selected one of the odd and even numbered concentric track centerlines;

means for simultaneously enabling the data transducers associated with the surfaces of said at least two data storage disks containing said first and second servo burst signals for reading said servo burst signals;

means for simultaneously separately detecting the absolute value of the envelope of each of said first and second servo burst signals; and

means for comparing each of said detected envelope signals in order to generate a position error signal for application to said driver means for promoting and maintaining track centerline alignment of an enabled data transducer during operation of said magnetic disk storage means.

4,638,385

TAPE RECORDER HAVING AN IMPROVED SYSTEM FOR CONTROLLING TAPE TRAVEL AND MAGNETIC HEAD MOVEMENT

Naomichi Kohri, Maebashi, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 14, 1984, Ser. No. 610,247

Claims priority, application Japan, May 18, 1983, 58-87364

Int. Cl.[4] G11B *5/008, 5/54, 21/22, 21/08*

U.S. Cl. 360—96.4 **9 Claims**

1. A tape recorder having an improved system for controlling tape travel and magnetic head movement, said tape recorder playing a tape cassette which accommodates a tape and is loaded into said tape recorder in a mode which is selected out of a forward reproduction mode in which a reproduction is carried out while the tape moves in a forward direction, a reverse reproduction mode in which the reproduction is carried out while the tape moves in a reverse direction, and a third

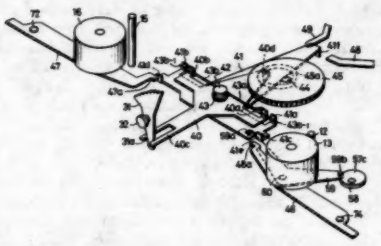
mode other than the forward and reverse reproduction modes, said tape recorder comprising:

a first pinch roller mechanism for pressing against a first capstan and for moving the tape in the forward direction during said forward reproduction mode;

a second pinch roller mechanism for pressing against a second capstan and for moving the tape in the reverse direction during the reverse reproduction mode;

a magnetic head mechanism having a magnetic head for rotating the magnetic head over one-half revolution in response to a reversal of the tape traveling direction, said magnetic head assuming first rotational position of the magnetic head when said tape moves in the forward direction and assuming a second rotational position of the magnetic head when said tape moves in the reverse direction;

control means for selectively operating said first pinch roller mechanism or said second pinch roller mechanism responsive to said mode, and for operating said magnetic head mechanism, said control means comprising a first rotary lever for operating said magnetic head mechanism so as to determine a rotational position of the magnetic head by rotating the magnetic head over one-half revolution responsive to a rotational position of the first rotary lever, first rotating means for rotating said first rotary lever, a second rotary lever coupled to said first rotary lever through a resilient member, said second rotary lever rotating together with said first rotary lever so as to assume one



of first and second rotational positons of said second rotary lever depending on the rotational position of said first rotary lever, said first and second rotary levers having a common rotary axis, and second rotating means for deforming said resilient member and for rotating said second rotary lever to a third rotational position separately from said first rotary lever during said third mode, said first rotating means comprising a cam part for engaging with a part of said first rotary lever so as to determine said rotational position of said first rotary lever depending on the mode of said tape recorder; and

driving means for driving said cam part of said first rotating means,

said second rotary lever making it possible to transmit a rotation to a take-up reel shaft, making said first pinch roller mechanism operative, and making said second pinch roller mechanism inoperative in said first rotational position of said second rotary lever,

said second rotary lever making it possible to transmit a rotation to a supply reel shaft, making said second pinch roller mechanism operative, and making said first pinch roller mechanism inoperative in said second rotational position of said second rotary lever,

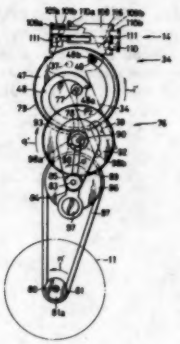
said second rotary lever making it impossible to transmit a rotation to said take-up reel shaft and said supply reel shaft, and making said first and second pinch roller mechanisms inoperative in said third rotational position of said second rotary lever.

4,638,386

OPERATION CHANGING MECHANISM RESPONSIVE TO DIRECTION CHANGE OF A REVERSIBLE MOTOR

Ryoji Takamatsu, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,664
Claims priority, application Japan, Jun. 23, 1982, 57-108143
Int. Cl.[4] G11B *5/008, 15/00, 17/00;* G03B *1/04*
U.S. Cl. 360—96.5 3 Claims



1. An operation changing mechanism for an electronic apparatus, comprising:

a rotatable driving gear;

means including an electric motor for selectively rotating said driving gear in opposed first and second directions;

a first swinging gear in meshing engagement with said driving gear for rotation by the latter and a second swinging gear coaxial with said first swinging gear and rotatably coupled with the latter;

mounting means rotatable supporting said first and second swinging gears and being swingable about the axis of said driving gear for orbital movements of the common axis of said first and second swinging gears about said driving gear while maintaining said meshing engagement between the latter and said first swinging gear;

stop means for limiting said orbital movements in opposite directions at first and second positions of said common axis and to which the latter is urged in reaction to rotation of said driving gear in said first and second directions, respectively, while in said meshing engagement with said first swinging gear;

a rotary cam member having peripheral gear teeth engageable by said second swinging gear from turning of said rotary cam member between first and second rotary positions said peripheral gear teeth having a toothless gap with a peripheral dimension to accommodate said second swinging gear and thereby halt turning of said rotary cam member in said first and second positions when said common axis of the swinging gears is in said first and second positions, respectively thereof, the extent of said orbital movements between said first and second positions of the common axis being related to said peripheral dimension of the toothless gap so that with said common axis in one of said first and second positions thereof and said second swinging gear accommodated in said toothless gap of the rotary cam member in one of said first and second positions of the latter, the orbital movement of said common axis to the other of said first and second positions engages said second swinging gear with said peripheral gear teeth for turning said rotary cam member in a respective direction to the other of said first and second positions of the latter, said rotary cam member further having at least one cam surface thereon;

an actuating member engaging said cam surface and being

reciprocally moved thereby in response to turning of said rotary cam member between said first and second positions of the latter for changing a respective operation of an electronic apparatus; and

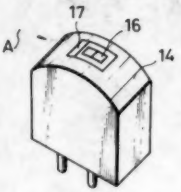
locking means for selectively locking said rotary cam member at said first and second positions thereof and thereby preventing inadvertent turning of said rotary cam member.

4,638,387

COMPOSITION FOR SLIDING CONTACT PART OF RECORDING/REPRODUCING APPARATUS

Koichi Mukasa; Takashi Hatanai, both of Nigata; Keishi Nakashima, Yunotani, and Kazumasa Onishi, Nigata, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 5, 1983, Ser. No. 558,328
Int. Cl.[4] G11B *5/187, 15/60*
U.S. Cl. 360—122 10 Claims



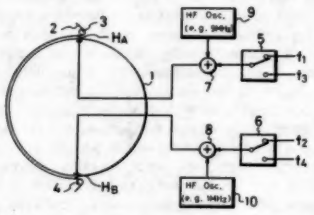
1. A recording/reproducing apparatus characterized in that a sliding contact part coming into sliding contact with a magnetic recording medium is provided adjacent a magnetic head core on an upstream side thereof, as determined by a running direction of the magnetic recording medium relative to the magnetic head core, and at least a portion of the sliding contact part, said portion coming into sliding contact with the magnetic recording medium, is made of a composite material comprising a carbonaceous material, of 50–95% by volume, and a mechanical strength-increasing material.

4,638,388

METHOD OF MAKING A LINEARITY STANDARD MAGNETIC TAPE

Masaru Hara, Aichi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,122
Claims priority, application Japan, Dec. 26, 1983, 58-251877
Int. Cl.[4] G11B *5/02, 27/36*
U.S. Cl. 360—18 7 Claims



1. A method of making a linearity standard magnetic tape comprising the steps of:

(a) providing rotary magnetic head means including a pair of magnetic heads having gaps with different azimuth angles, respectively, and for recording slant tracks alternately on a magnetic tape;

(b) supplying a first pilot signal of low frequency and a linearity standard signal of high frequency to one of said magnetic heads; and

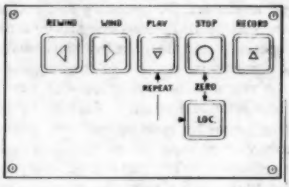
(c) supplying to the other of said magnetic heads a second pilot signal of low frequency and a bias signal of sufficiently higher frequency than said linearity standard signal as to be omitted from the recording on said tape by said other magnetic head.

4,638,389

CONTROL PANEL FOR A TAPE RECORDER

Rüdiger Barth, Insel Reichenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Jan. 7, 1986, Ser. No. 816,717
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 3500540
Int. Cl.[4] G11B *15/18*
U.S. Cl. 360—72.1 2 Claims



1. A control panel for a magnetic tape recorder comprising a main memory associated with said recorder, and wind, rewind, recording, playback, location, and stop buttons, and button responsive means for carrying out the designations indicated by the buttons, and wherein on actuating one of the recording buttons (RECORD) and the playback button (PLAY) the respective tape location is automatically stored in said main memory by said button responsive means;

under said stop buttton designated (STOP) said location button designated (LOC) is arranged;

on actuating said location button (LOC), the magnetic tape is stopped, the tape locations stored in the main memory is read, and the magnetic tape is rewound to this tape location by said button responsive means;

on simultaneous actuation of the location button (LOC) and of this stop button (STOP), the magnetic tape is stopped and rewound to the tape location zero by said button responsive means;

on simultaneous actuation of the location button (LOC) and of the playback button (PLAY), the magnetic tape is stopped, the tape location reached is stored as per "take" end, the magnetic tape is rewound to the last recording or playback location stored in the memory, and in automatic repetition played back between the tape location the stopped location by said button responsive means.

4,638,390

RECORDING APPARATUS

Susumu Kozuki, Tokyo; Kenichi Nagasawa, Kanagawa; Hiroo Edakubo, Tokyo; Junichi Sato, Kanagawa, and Nobutoshi Takayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

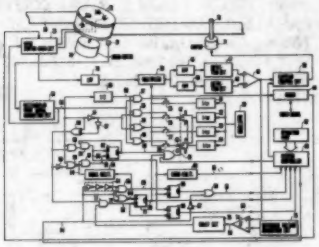
Filed Dec. 3, 1985, Ser. No. 804,350
Claims priority, application Japan, Dec. 4, 1984, 59-256760
Int. Cl.[4] G11B *15/18, 5/56*
U.S. Cl. 360—74.1 24 Claims

20. A recording apparatus for recording an information signal on a record bearing medium, comprising:

(a) recording means for forming recording tracks by recording said information signal on said record bearing medium;

(b) synchronous signal generating means for generating a synchronous signal in accordance with the recording track forming action of said recording means;

(c) instruction means for producing a recording stop instruction to bring the recording operation of said recording apparatus to a stop; and



(d) stopping means for detecting said synchronous signal and, upon completion of formation of a predetermined number of said recording tracks, after the instruction of said instruction means is produced, to cause the recording operation of said recording means to come to a stop.

4,638,391

VERTICAL RECORDING MAGNETIC HEAD HAVING SINGLE CORE BODY BONDED WITH MAIN MAGNETIC POLE IN GUARD LAYER

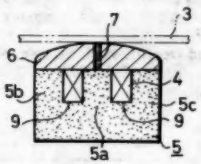
Takashi Hatanai, Koide; Keishi Nakashima, Yunotani, and Koichi Mukasa, Koide, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 11, 1984, Ser. No. 619,034

Claims priority, application Japan, Sep. 6, 1983, 58-101747; Sep. 6, 1983, 58-101748; Nov. 6, 1983, 58-103540

Int. Cl.⁴ G11B *5/12, 5/22*

U.S. Cl. 360—125 **9 Claims**



1. A magnetic head for recording vertically by a main magnetic pole oriented perpendicular to a horizontal surface of a recording medium, comprising:

(a) a core body made of magnetic material having a central leg extending vertically therefrom with one end facing in the direction of the recording medium, means defining a recess adjacent said central leg for supporting an electromagnetic coil therein, and side legs spaced apart from said central leg;

(b) a guard member made of non-magnetic material supported on one side thereof on said central and side legs of said core body, and having on an opposite side thereof a surface adapted to be placed in contact with said recording medium;

(c) said guard member having formed therein a thin layer of magnetic material extending vertically therethrough from said one side to said opposite side to said contact surface acting as a main magnetic pole for vertical recording on said recording medium, said thin magnetic layer having one end placed in contact with said one end of said central leg of said core body.

4,638,392

MAGNETIC HEAD PRESSURE PAD DEVICE

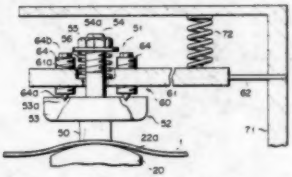
Mitsuru Akutsu, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 21, 1983, Ser. No. 477,362

Claims priority, application Japan, Jul. 12, 1982, 57-105393[U]

Int. Cl.⁴ G11B *15/60, 5/56*

U.S. Cl. 360—130.32 **8 Claims**



1. A magnetic head device comprising:

(a) a magnetic head for recording a signal on a recording medium and for reproducing the signal therefrom, said magnetic head comprising:

(i) a head guide including an engaging portion in a side surface thereof and p2 (ii) a guide surface which is brought into sliding contact with the recording medium during use of the device;

(b) supporting means for supporting said magnetic head, said supporting means comprising:

(i) a support table;

(ii) a support member attached to said support table and arranged to be movable so as to support and move said magnetic head toward and away from said support table; and

(iii) an elastic member provided on said support table and engaged with said engaging portion in said head guide so as to bias said head guide toward said support member;

(c) a pressure pad opposing said guide surface in position to urge a recording medium which travels between said guide surface and said pressure pad toward said guide surface during use of the device;

(d) a mounting portion for mounting said pressure pad; and

(e) a supporting portion for supporting said mounting portion, said supporting portion comprising:

(i) a base plate movably mounted with respect to said support table;

(ii) means for resiliently biasing said base plate toward said magnetic head;

(iii) a shaft on which said mounting portion is mounted, said shaft being slidably received in a throughhole in said base plate;

(iv) means for biasing said mounting portion toward said base plate; and

(v) a plurality of threaded members threadedly engaged in said base plate and bearing against said mounting portion, said plurality of threaded members being usable to adjust the distance between said mounting portion and said base plate by turning said plurality of threaded members in said base plate.

4,638,393

MAGNETIC TAPE CASSETTE HAVING AN IMPROVED BRAKING MECHANISM

Kengo Oishi, and Osamu Suzaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1983, Ser. No. 529,180

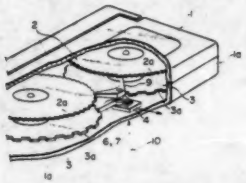
Claims priority, application Japan, Sep. 2, 1982, 57-151781

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—132 **4 Claims**

1. A magnetic tape cassette comprising a pair of tape reels

rotatably mounted within said cassette for rotation about parallel spaced apart axes, each reel having upper and lower flanges with one of said flange having the periphery thereof formed into a flat-tooth-shaped gear and the other of said flanges having a periphery thereof formed into a saw-tooth-shaped gear, and a reel braking assembly moveably mounted within said cassette comprising first ratchet pawls engageable with



said flat-tooth-shaped gears, second ratchet pawls engageable with said saw-tooth-shaped gears, and support means for said first and second ratchet pawls, said first ratchet pawls being selectively disengageable from said flat-tooth-shaped gear at a first time during operation of a tape recorder, said second ratchet pawls being selectively disengageable from said saw-tooth-shaped gear at a second time, subsequent to said first time, during said operation of said tape recorder.

4,638,394

TAPE AMOUNT DISPLAYING APPARATUS

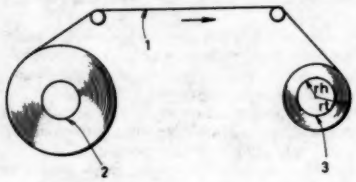
Masaharu Hayakawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,520

Claims priority, application Japan, Sep. 2, 1982, 57-154417

Int. Cl.[4] G11B *15/18, 19/06*

U.S. Cl. 360—137 **6 Claims**



1. A tape amount displaying apparatus for displaying sequentially an amount of a tape of known thickness of d wound on a rotating reel with a tape winding hub of known radius r_h, comprising;

outermost periphery length indicating signal outputting means for outputting a signal indicating the length of the outermost periphery of said tape wound on said reel;

number of turns detecting means for detecting the number of turns n made by said reel;

rotational direction detecting means for detecting the direction of said rotation of said reel;

first arithmetic means, operative in synchronization with said output signal from said number of turns detecting means, for adding a predetermined value $2\pi nd$ from said signal from said outermost periphery length indicating signal outputting means, respectively according to whether said tape is wound on or off said rotating wheel, so that a current outermost periphery length l_l of said tape is evaluated as a first evaluation result;

second arithmetic means for evaluating as a second evaluation result the current tape amount L_l wound on said reel based on said first evaluation result from said first arithmetic means such that $L_l=(l_l^2-4\pi r_h^2)/4\pi d$; and

displaying means for displaying said second evaluation result from said second arithmetic means.

4,638,395

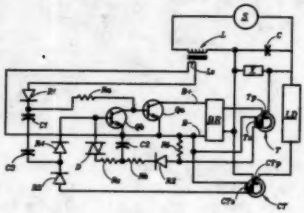
PROTECTOR FOR SERIES-EXCITED PARALLEL-LOADED RESONANT CIRCUIT

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Dec. 26, 1984, Ser. No. 686,447

Int. Cl.[4] H02H *3/12*

U.S. Cl. 361—93 **10 Claims**



10. A power supply arrangement comprising:

a source of periodic high-frequency AC voltage;

an L-C circuit series-connected across said source, said L-C circuit being resonant at or near the frequency of said AC voltage and having at least one inductive and one capacitive reactance means;

a load connected in parallel with one of said reactance means; and

shorting means operative, except when current is flowing through the load, to effectively provide an intermittently interrupted short circuit across said one of said reactance means.

4,638,396

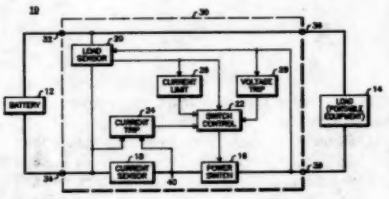
INTRINSICALLY SAFE BATTERY CIRCUIT

Glenn A. Mukli, Aurora; Paul C. Frew, and David R. Mills, both of Scarborough, all of Canada, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1984, Ser. No. 687,666

Int. Cl.[4] H02H *9/02*

U.S. Cl. 361—101 **13 Claims**



1. An overload protection circuit for limiting the amount of power delivered from a power source to a load, said protection circuit comprising:

input terminals;

output terminals;

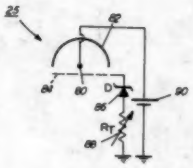
power controlling means coupling said input terminals to said output terminals for controlling the amount of power delivered to said output terminals; and

load sensing means for sensing the presence of a load at said output terminals and for directing said power controlling means to deliver power to said output terminals only when a load is present, said load sensing means preventing said power controlling means from consuming power from said input terminals except when a load is present.

4,638,397
SELF-BIASED SCOROTRON AND CONTROL THEREFOR

Geoffrey M. T. Foley, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1984, Ser. No. 685,182
Int. Cl.[4] H01T 19/04
U.S. Cl. 361—212 9 Claims



1. A corona discharge device for use with a charge retentive surface, said device comprising:

at least one electrode;

a conductive shield spaced from said electrode;

means for applying a voltage to said electrode;

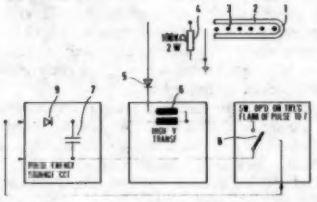
a wire grid supported adjacent said electrode, said electrode being disposed intermediate said conductive shield and said wire grid; and

self-biasing means including constant voltage impedance means and manually settable variable impedance means connecting said wire grid to ground, said manually settable variable impedance means serving to effect adjustment of said self-biasing means in accordance with the nominal impedance value of said constant voltage impedance means.

4,638,398
APPARATUS FOR PRODUCING POSITIVE OR NEGATIVE IONS, ESPECIALLY FOR NEUTRALIZING CHARGED WORKPIECES

Hermann Brennecke, Darmstadt; Horst Liere, Eppertshausen, and Michael Kiesel, Gross-Umstadt, all of Fed. Rep. of Germany, assignors to IRS Industrie Rationalisierungs-Systeme GmbH, Darmstadt-Eberstadt, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,443
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412563
Int. Cl.[4] B03C 3/66
U.S. Cl. 361—214 14 Claims



1. Apparatus for producing ions of a preselected polarity including a grounded electrode having electric-field accentuating points and a high-voltage electrode near, but spaced from, said grounded electrode and insulated by solid insulation from its surroundings but substantially uninsulated from said grounded electrode except by intervening air space, and further comprising:

a capacitor (7) having a substantially grounded terminal and an ungrounded terminal, for intermittently storing electric energy;

means for intermittently charging said capacitor and thereby intermittently accumulating a voltage of a predetermined polarity at said ungrounded terminal of said capacitor;

circuit means for intermittently discharging said capacitor at instants when it has reached a predetermined level of charge and simultaneously providing a high-voltage pulse for said high-voltage electrode;

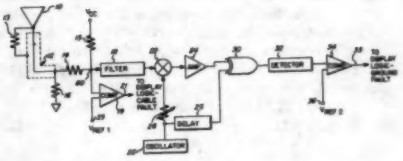
a connection between said high-voltage electrode and said discharging circuit means for applying, to said high-voltage electrode, high voltage pulses provided by said discharging circuit means, said connection including a diode (5) interposed between said high-voltage electrode and said discharging means for preventing a return flow of current from said high-voltage electrode and assuring that ions produced are predominantly of the same polarity, and

an electrical resistance (4) connected between said high-voltage electrode and ground for substantially discharging said high-voltage electrode during intervals between said high-voltage pulses said electrical resistance being of a resistance magnitude permitting substantial discharge of said high-voltage electrode during each one of said intervals between said high-voltage pulses.

4,638,399
WRIST STRAP GROUND MONITOR

Ralf P. Maroney, Orange; Gregory A. Fishkind, Milford, and Frederick Schneider, Stratford, all of Conn., assignors to Plug-In Storage Systems, Inc., Milford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,053
Int. Cl.[4] H05F 3/02; A61N 1/14; G01R 31/02
U.S. Cl. 361—220 22 Claims



1. Apparatus for monitoring the integrity of a wrist strap ground comprising:

an input terminal;

an oscillator;

means for mixing the output of said oscillator with a signal from said input terminal to provide a composite signal;

an exclusive OR-gate;

means for coupling the composite signal to a first input of said OR-gate;

means for coupling the output of said oscillator to a second input of said OR-gate; and

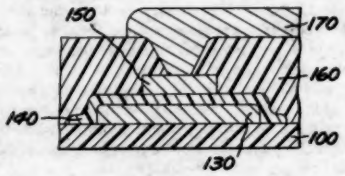
means for processing the output of said OR-gate to produce an output signal indicative of the phase relationship between said oscillator output and said composite signal;

whereby grounding said input terminal varies the phase relationship between said oscillator output and said composite signal resulting in a change in said output signal.

4,638,400
REFRACTORY METAL CAPACITOR STRUCTURES, PARTICULARLY FOR ANALOG INTEGRATED CIRCUIT DEVICES

Dale M. Brown; Manjin J. Kim, both of Schenectady; Richard D. Baertsch, Scotia, and Thomas L. Vogelsong, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1985, Ser. No. 790,911
Int. Cl.[4] H01G *1/015;* B41M *3/08;* H01L *27/02*
U.S. Cl. 361—304 19 Claims



1. A capacitor structure, for use in integrated circuit devices, said capacitor structure comprising:

a substrate having an insulative layer disposed thereon;

a first layer of conductive material disposed on said insulative layer on said substrate;

a dielectric layer deposited over said first conductive layer;

a layer of metal disposed on said dielectric layer, said layer of metal comprising a refractory metal;

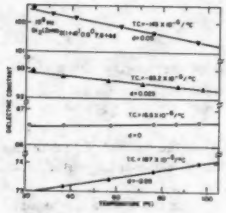
an insulative layer disposed over said refractory metal layer, said insulative layer having an aperture therein adjacent to at least a portion of said refractory metal layer; and

an interconnection metal layer disposed on said insulative layer and extending through said aperture in said insulative layer so as to make contact with said refractory metal.

4,638,401
CERAMIC COMPOSITIONS AND DEVICES

Hung C. Ling, West Windsor Township, Mercer County, and Man F. Yan, Berkeley Heights, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Inc., Murray Hill, both of, N.J.

Continuation-in-part of Ser. No. 666,200, Oct. 29, 1984, abandoned. This application Jan. 10, 1986, Ser. No. 817,805
Int. Cl.[4] H01G *4/10;* C04B *33/34, 35/46*
U.S. Cl. 361—321 16 Claims



1. A capacitor comprising at least one pair of spaced electrodes and a ceramic composition therebetween said composition comprising a sintered mixture as represented by the formula

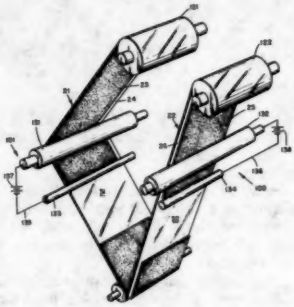
$$(1-x)Bi_2(ZnNb_{2(1+d)}{}_yO_{3+6y+5dy}(x)Bi_3(Ni_2Nb)O_9$$

where $0<x<1$, $0.6\leq y\leq 1.1$ and $-0.05\leq d\leq 0.05$, x representing a weight fraction.

4,638,402
MULTI-SECTION CAPACITOR ELECTRICALLY COUPLED IN PARALLEL

Basilio Y. Lim, 12931 Sunnyside Pl., Santa Fe Springs, Calif. 90670, and Richard N. Marsh, 5424 Sunflower Ct., Livermore, Calif. 94550

Filed May 7, 1985, Ser. No. 731,852
Int. Cl.[4] H01G *4/38, 7/00*
U.S. Cl. 361—328 1 Claim



1. A multi-section capacitor comprising:

a. a plurality of capacitor sections with each of said plurality of capacitor sections having a right end and a left end and being wound from a length of a first metallized dielectric film having disposed on its near surface a first thin metallized layer which terminates short of both its left edge and its right edge leaving a first non-metallized strip along said left edge and a second non-metalized edge along said right edge in combination with a length of a second metallized dielectric film having disposed on its near surface a second thin metallized layer which extends to its left edge but terminates short of its center and a third thin metallized layer which extends to its right edge but also terminates short of its center leaving a non-metallized strip therealong so that said first, second and third thin metalized layers are separated by dieletric film wherein a portion of said first thin metalize layer is removed at a region intermediate the ends of said length for a distance sufficient to encircle said capacitor section at least once;

b. first electrically contacting means for making an electrical contact with said second thin metalized layer of each of said plurality of capacitor sections with said first electrically contacting means being disposed adjacent and mechanically coupled to each of said left ends of said plurality of capacitor sections; and

c. second electrically contacting means for making an electrical contact with said third thin metalized layer of each of said plurality of capacitor sections with said second electrically contacting means being disposed adjacent and mechanically coupled to each of said right ends of said plurality of capacitor sections.

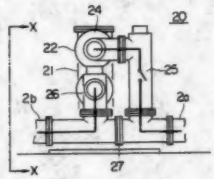
4,638,403
GAS-INSULATED SWITCHGEAR APPARATUS

Naoki Amano; Hitoshi Kayaba, and Takehiro Kikuchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,480
Claims priority, application Japan, Jun. 15, 1983, 58-105667
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—341 7 Claims

1. A gas-insulated switchgear apparatus comprising two main bus bars extending substantially along a common axis and

having respective end portions spaced from each other, feeder units connected to said two main bus bars, respectively, and a bus-bar dividing unit including one circuit breaker of vertical type disposed with its vertical axis substantially aligned with the end portion of one of said two main bus bars, when viewed in a direction perpendicular to the common axis of said two main bus bars, a lower electric path directly connecting said



one circuit breaker to the end portion of said one of said two main bus bars, and an upper electric path including at least a portion perpendicular to a direction of said common axis and a portion parallel to the direction of said common axis to directly connect said one circuit breaker to the end portion of the other of said two main bus bars so that said two main bus bars are connected through said one circuit breaker.

4,638,404

CLAMPING DEVICE FOR PLATE-SHAPED SEMICONDUCTOR COMPONENTS

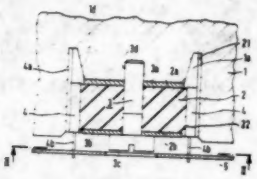
Kurt Grossmann, Hallerndorf; Jurgen Bliesner, Hembofen, and Joachim Schiker, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,734

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215192

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—388 **6 Claims**



1. A device which clamps a plurality of plate-shaped semiconductor components to a heat sink provided with a recess having a plurality of walls formed by respective inner surfaces of the heat sink, comprising:

a pressure element having a plurality of lateral contact surfaces and a pair of transverse end faces, each lateral contact surface being oriented parallel to an associated wall of said recess, said pressure element consisting of elastically compressible material, and

pressure application means engageable with said end faces and exerting a clamping force thereon to compress said pressure element, each semiconductor component being disposed between one of said lateral contact surfaces and the associated wall of said recess, each semiconductor component having a planar face substantially entirely in contact with the respective lateral contact surface of said pressure element, each of said lateral contact surfaces being shiftable laterally outwardly and substantially perpendicularly to the associated wall of said recess upon an application of said clamping force to said end faces, whereby said semiconductor components are clamped to said heat sink.

4,638,405

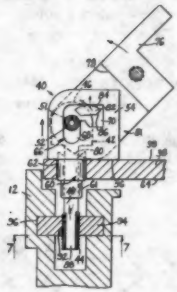
INJECTOR/EJECTOR DEVICE FOR CIRCUIT BOARD

Kenneth R. Smith, Southington, Conn., assignor to Bicc-Vero Electronics, Inc., Trumbull, Conn.

Filed Dec. 16, 1985, Ser. No. 809,473

Int. Cl.⁴ H01R *13/62*; H05K *5/02*

U.S. Cl. 361—399 **14 Claims**



1. An injection/ejection device to aid in the entry and removal of an object from a mating apparatus, said device comprising:

a lever with a bifurcated portion, said portion, being rotatably attached to the ends of a pivot pin;

bracket means slidably mounted onto said pivot pin within said bifurcated portion and further comprising means for rotatably mounting the device onto the object;

anchor means fixedly attached within said bifurcated portion to said pivot pin and further having engagement means to attach the object to the apparatus at an opposite end;

first means for generating an outwardly directed linear force within said object; and

second means for generating an inwardly directed linear force within the object, whereby the object may be injected into and ejected from the apparatus.

4,638,406

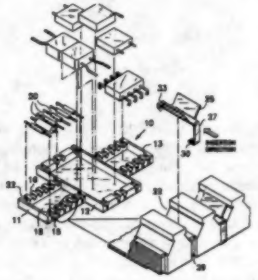
DISCRETE COMPONENT MOUNTING ASSEMBLY

Robert Samson, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 657,639, Oct. 4, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 854,680

Int. Cl.⁴ H05K *1/18*

U.S. Cl. 361—403 **9 Claims**



1. A discrete component mounting assembly comprising:

a base member formed of electrically insulating material with first and second spaced apart end portions;

each of said first and second end portions having elongated notches formed therein with a generally v shaped cross section for receiving component leads therein;

a generally trough shaped contact, formed of electrically conductive material, fixedly positioned in each of said notches and including a portion extending beyond the notch for external electrical connection; and

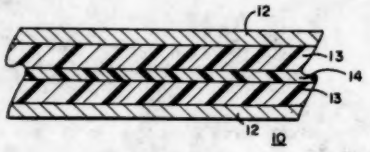
said base member further including a relatively flat mounting surface and the extending portion of each trough shaped contact extending into a partial overlying position with said flat surface to form a connecting pad.

4,638,407

SOLID STATE ELECTROCHEMICAL DEVICE

Jorgen S. Lundegaard, c/o Hope Industries, Inc., 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed May 20, 1985, Ser. No. 735,880
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 **10 Claims**



1. An all-solid state multicell electrochemical device comprising in combination:

(a) a plurality of carbon-containing bipolar electrode structures; and

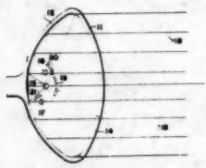
(b) a plurality of solid-state electrolyte layers consisting essentially of a polymer material rendered ionically conductive by addition of an inorganic salt; said electrode structures and said electrolyte layers being functionally arranged to provide an electrochemical device.

4,638,408

AUTOMOBILE HEADLIGHT-FOG LIGHT COMBINATION

Aubrey D. Wetherington, Rte. 1, Box 181, Hahira, Ga. 31632

Filed Jun. 28, 1984, Ser. No. 625,833
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—61 **2 Claims**



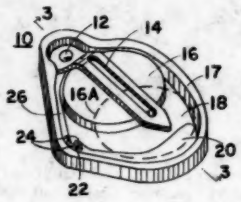
1. An automobile headlight having a parabolic reflector and a transparent lens with a segment at the bottom of the lens tinted to cause the light passing therethrough to function as a fog light, said headlight having a high beam filament positioned substantially at the focus of the parabolic reflector, a low beam filament positioned above said high beam filament and so as to direct light against said reflector to reflect light in a downward direction, and a fog light filament positioned below said high beam filament and having a reflector shield positioned above and rearward of said fog light filament so as to direct substantially all light from said filament through said reflector such that the light reflected therefrom will pass through said tinted segment.

4,638,409

SWITCHING METHOD AND DEVICE USING MOVABLE BATTERY

Marc Berman, 10 Ashford St., Allston, Mass. 02134

Filed Nov. 8, 1985, Ser. No. 796,165
Int. Cl.[4] A44C 9/00
U.S. Cl. 362—104 **20 Claims**



1. A movable power source switching means for an electrically powered element or device, wherein the switching means comprises:

an electrically powered device;

a receiving means for an electrical power source, wherein the receiving means comprises a retaining means for slidably retaining the power source between at least a first and second position within the retaining means;

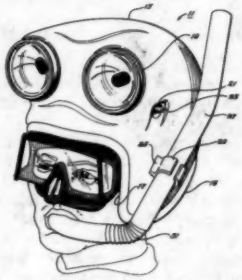
an electrical conductor connecting the power source receiving means to the electrically powered device, wherein the power source in the first position contacts the conductor to make a closed circuit between the power source and the electrically powered device thereby activating the electrically powered device, and wherein the power source in the second position breaks the circuit thereby deactivating the electrically powered device.

4,638,410

DIVING HELMET

Randall R. Barker, 6200 Carswell Access Rd. #3, Fort Worth, Tex. 76114

Filed Feb. 23, 1981, Ser. No. 236,871
Int. Cl.[4] F21L 15/14
U.S. Cl. 362—105 **11 Claims**



1. In a diving helmet of the type having a rigid exterior, an interior for receiving a diver's head, the interior being open at the bottom and face, the improvement comprising:

a cavity located in the top portion of the helmet, sealed from the interior of the helmet and having a cylindrical entrance facing forwardly;

a cylindrical lamp housing slidably and rotatably mounted in

the entrance of the cavity, and having a light source contained therein;

seal means between the lamp housing and the entrance for sealing the cavity from water; and

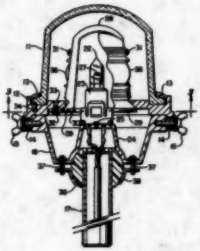
directional means for directing light from the light source at an acute angle with respect to the axis of the lamp housing, so that the light source will point in different directions as the lamp housing is rotated.

4,638,411

MODULAR HIGH-INTENSITY ELEVATED RUNWAY EDGE OR THRESHOLD LIGHT

Willis H. Trainor, Newark, Ohio, assignor to ADB-Alnaco, Inc., Columbus, Ohio

Filed Oct. 4, 1985, Ser. No. 784,069
Int. Cl.[4] F21S *1/14*
U.S. Cl. 362—145 3 Claims



1. An elevated modular high-intensity runway edge or threshold light comprising:

a substantially hollow base having a bottom wall,

a ball joint centrally positioned in the bottom wall of said base and adapted to receive an upstanding conduit, said ball joint comprising an adjustable securing means for fixedly positioning said base and said ball joint onto said upstanding conduit,

means supported centrally on said base adapted to receive a light source and fixedly positioned with respect to said base,

a cover comprising a lower annular portion and a hollow glass dome, including oppositely disposed prism portions adapted to compress the light emanating from said light source in one plane, said glass dome being sealed in said lower annular portion and fixedly positioned with respect thereto, said lower annular portion having an inner base portion resting on the upper portion of said hollow base,

a hollow circular support removably secured to the lower portion of said inner base portion of said cover and supporting two hollow prisms adapted to surround said light source and being fixedly positioned in relation to the prisms in said hollow glass dome, said two hollow prisms being adapted to compress the light emanating from said light source in a plane perpendicular to the plane in which the light from said light source is compressed by the prism portions of said hollow glass dome before said light passes through the prism portions of said hollow glass dome,

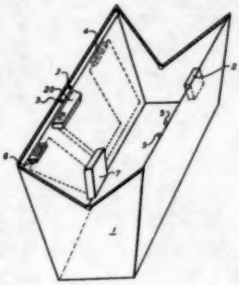
whereby said two hollow prisms and said prisms in said hollow glass dome are fixedly positioned in relation to each other and in combination provide two oppositely disposed areas of high-intensity light, and said entire assemblage may be readily removed for maintenance.

4,638,412

AUTOMATIC POCKETBOOK ILLUMINATOR

Hans Weigert, Ridgewood, N.J., assignor to Mixed Bag Imports, Inc., Englewood, N.J.

Filed Jan. 27, 1986, Ser. No. 822,885
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—156 10 Claims



1. A method for energizing a lightbulb mounted on an interior surface of a pocketbook, for illuminating the interior of said pocketbook, comprising the steps of:

sensing the level of ambient light at times that said pocketbook is opened; and

energizing said light bulb whenever the sensed level of ambient light is relatively low.

3. Apparatus for illuminating the interior of a pocketbook, comprising:

lamp means mounted on an inside surface of said pocketbook, for upon energization illuminating the interior of said pocketbook; and

control means mounted within said pocketbook, including means for indicating an open pocketbook, and means for sensing the level of ambient light, for energizing said lamp means only in response to both an open pocketbook and a relatively low-level of ambient light.

4,638,413

COMBINATION SPOTLIGHT AND TABLE LAMP

Kenneth Tarlow, 138 Waterview St., Playa del Rey, Calif. 90293

Filed Nov. 15, 1984, Ser. No. 671,677
Int. Cl.[4] F21V *13/00*
U.S. Cl. 362—242 5 Claims

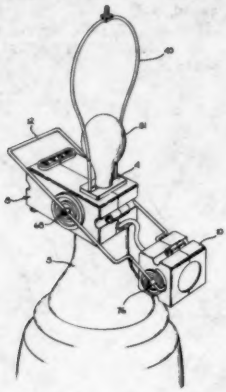
1. A combination electrical spotlight and table lamp, comprising:

(a) a spotlight fixture;

(b) a lamp fixture surrounding and eccentrically offset to a lamp socket with a central longitudinal axis; and

(c) an extension element, pivotally attached to a portion of the lamp fixture which is longitudinally offset to the socket and extending past and away from the central axis

of the lamp socket, wherein the spotlight fixture is pivotally attached to the extension element at a location offset



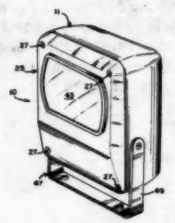
from the socket central axis in a direction opposite said offset portion.

4,638,414

LUMINAIRE WITH ROTATABLE REFLECTOR

Hendrik A. J. de Vos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Apr. 4, 1985, Ser. No. 720,111
Int. Cl.[4] F21V *11/00*
U.S. Cl. 362—370 **12 Claims**



1. A luminaire comprising:

a housing of substantially boxlike configuration and defining an opening therein;

a component mounting plate of substantially planar configuration and secured to said housing substantially across said opening, said component mounting plate including an aperture therein defined by two pairs of opposed sides, the sides of a first of said pairs being of substantially straight configuration and the sides of a second of said pairs being of substantially curved configuration;

a cover member secured to said housing for providing a cover for said opening, said cover member including a lens therein;

a reflector rotatively positioned on said component mounting plate adjacent said aperture and capable of occupying at least two positions thereon each oriented at least about ninety degrees relative to the other, said reflector reflecting light through both said aperture within said component mounting plate and said lens;

a socket secured to said reflector; and

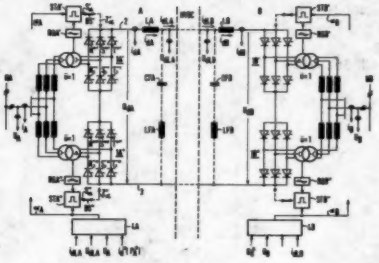
a lamp positioned within said socket and being located within said reflector, both said lamp and said socket thereby being rotated simultaneously with said reflector such that said luminaire is capable of providing light output distributions of at least two different orientations relative to said luminaire.

4,638,415

METHOD AND APPARATUS FOR RESUMPTION OF NORMAL OPERATION OF A HIGH-VOLTAGE D. C. TRANSMISSION LINE

Helmut Neupauer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,754
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407656; Sep. 26, 1984, 3435305; Oct. 18, 1984, 3438236
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **26 Claims**



19. An apparatus for High Voltage Direct Current, HVDC, transmission having a high-voltage d.c. transmission line; a first station connected to one end of the high-voltage d.c. transmission line; a first converter connected to the first station and normally operated in system-synchronous operation as a rectifier; a first a.c. system connected to the first converter; a second station connected to the other end of the high-voltage d.c. transmission line; a second converter connected to the second station and normally operated as a system-synchronous inverter, and a second a.c. system connected to the second converter; included in each station is a drive unit, controlled by a control and regulating device using a control angle and operated synchronously with the respective a.c. voltage system by a reference voltage generator, forming a sequence of system-synchronous firing commands for the respective converter, further included with each converter is a monitoring unit and a clamping circuit, whereby the clamping circuit being capable of inhibiting the respective firing commands when instructed to do so by the monitoring unit when a release signal is formed, or capable of being converted to providing firing commands for the converter thyristors, further comprising:

first monitoring means within and connected to the monitoring unit connected to the previously malfunctioning station forming a leading release signal whenever monitoring of the a.c. voltage network connected thereto indicates the existence of a normal condition of the a.c. voltage system;

second monitoring means within and connected to the monitoring unit connected to the continuously functioning station forming a derived release signal as soon as monitoring of the d.c. voltage side electrical quantities connected thereto detectably indicates the resumption of normal operation of the previously malfunctioning station;

means to inhibit the conductance of firing pulses whenever a fault indication signal occurs, connecting to each clamping circuit of the respective station said conductance inhibiting means being released by a respective leading or a derived release signal occurring; and

a respective run-up function generator connected in each station with a pre-programmed run-up function, said generator being triggered by said respective release signal and after a set run-up time is approximately the same as the operating level of control of the respective converter, to preset the control angle upon resumption of normal operation.

4,638,416

METHOD AND APPARATUS FOR HIGH-VOLTAGE D.C. TRANSMISSION WITH A BYPASS CIRCUIT FOR MALFUNCTIONS

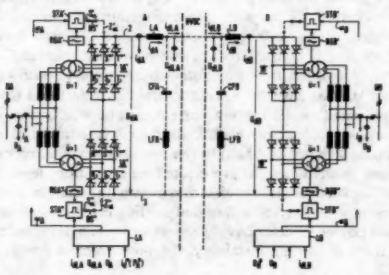
Helmut Neupauer; Wolfgang Kaufhold, both of Erlangen, and Georg Wild, Langensendelbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,755

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407656; Sep. 26, 1984, 3435305

Int. Cl.[4] H02J *3/36*

U.S. Cl. 363—35 39 Claims



28. An apparatus for HVDC transmission, including:

a first station connecting to a first a.c. system to draw electrical power therefrom;

a first converter being part of said first station and being connected to said first a.c. system; and operating as a system-synchronous rectifier during normal operation;

a HVDC transmission line being connected at one end to said first converter;

a second converter being connected to the other end of said HVDC transmission line and operating as a system-synchronous inverter during normal operation;

a second station having said second converter a part thereof and having connections thereto;

a second a.c. voltage system being connected to said second station;

a first reference voltage generator located in and connected to the first station for generating a system-synchronous reference voltage with respect to the first a.c. system;

a second reference voltage generator located in and connected to the second station for generating a system-synchronous reference voltage with respect to the second a.c. system;

a first controller forming a first control angle, connected to the first station;

a second controller forming a second control angle, connected to the second station B;

a first drive unit connecting to said first controller for forming a first set of system-synchronous firing commands;

a second drive unit connecting to said second controller for forming a second set of system-synchronous firing commands;

a first monitoring means monitoring the values of the electrical quantities of the first station and forming therefrom a first fault indication signal when a malfunction is indicated and a first release signal when return to normal operation is indicated;

a second monitoring means monitoring the values of the electrical quantities of the second station and forming therefrom a second fault indication signal when a malfunction is indicated and a second release signal when return to normal operation is indicated;

a first clamping circuit connected to a first drive unit and said first monitoring means inhibiting the transmission of said first firing commands whenever said first monitoring means forms said first fault indication signal, and transmitting said first fixing commands whenever said first monitoring means forms said first release signal; and

a second clamping circuit connected to a second drive unit and said second monitoring means inhibiting the transmission of said second firing commands whenever said second monitoring means forms said second fault indication signal, and transmitting said second firing commands whenever said second monitoring means forms said second release signal, comprising:

a first generating means as a part of the first monitoring means for generating a first leading fault indication signal when monitoring of the first a.c. system electrical quantities indicate the occurrence of a malfunction relative to the first station;

a second generating means as a part of the second monitoring means for generating a second leading fault indicator signal when monitoring of the second a.c. system electrical quantities indicate the occurrence of a malfunction relative to the second station;

a third generating means as a part of the first monitoring means for generating a first leading release signal when monitoring of the first a.c. system electrical quantities indicates discontinuance of a malfunction relative to the first station;

a fourth generating means as a part of the second monitoring means for generating a second leading release signal when monitoring the second a.c. system electrical quantities indicates the discontinuance of a malfunction relative to the second station;

a fifth generating means as a part of the first monitoring means for generating a first derived fault indication signal when monitoring the d.c. voltage electrical quantities indicates the occurrence of a malfunction in a location other than the first station;

a sixth generating means as a part of the second monitoring means for generating a second derived fault indication signal when monitoring the d.c. voltage electrical quantities indicates the occurrence of a malfunction in a location other than the second station;

a seventh generating means as a part of the first monitoring means for generating a first derived release signal when monitoring the d.c. voltage electrical quantities indicates a discontinuance of malfunction outside of the first station;

an eighth generating means as a part of the second monitoring means for generating a second derived release signal when monitoring the d.c. voltage electrical quantities indicates a discontinuance of malfunction outside of the second station;

a first memory as part of the first clamping circuit of the first station storing a combination of converter thyristors selected as bypass thyristors in the first station;

a second memory as part of the second clamping circuit of the second station storing a combination of converter thyristors selected as bypass thyristors in the second station;

a first and second switching means proximately located and connected to said first and second memory respectively, and further connected respectively to converter thyristors in the first and second converters, inhibiting the system synchronous firing commands to said converter thyristors of the respective station when a leading fault indication signal occurs therein, and generating bypass firing com-

mands to selected bypass thyristors of said respective station;

a first and second selector circuit connected to and proximately located to the first and second drive unit respectively, having a third and fourth memory respectively, contained therein, whereby after the firing of bypass thyristors in the respective station, a combination of start thyristors is stored for resumption of normal operation of the respective station;

a first and second logic circuit connected to said first and second selector circuit respectively, eliminating the inhibiting of system-synchronous firing commands after said respective leading release signal has occurred, and subsequently a firing command for one of the thyristors of said respective starting thyristor combination occurs; and

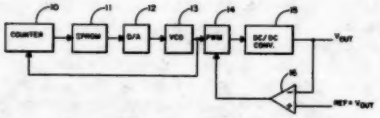
a first and second pre-programmed circuit, connected to the first and second control angle controllers respectively, interacting with the respective control angle in such a manner that after the start of the respective derived fault indication signal, the converter in the functional station is operated as a rectifier in bypass operation, until the occurrence of the respective derived release signal at which time bypass operation is terminated and normal operation resumed.

4,638,417

POWER DENSITY SPECTRUM CONTROLLER

Hubert C. Martin, Jr., Sandy; Gene D. Hitler, and David W. Parsley, both of Salt Lake City, all of Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 16, 1985, Ser. No. 766,186
Int. Cl.[4] H02M 1/12
U.S. Cl. 363—41 **11 Claims**



1. A signal control circuit which produces an output signal having little or no ripple, noise or signature, comprising,

pulse width modulator means,

voltage controlled oscillator (VCO) means connected to supply signals to the input of said pulse width modulator means,

coded means connected to supply signals to said VCO means and including storage means for storing a prescribed signal pattern which is selectively supplied to said VCO means,

control means comprising counter means for supplying signals to said storage means thereby to selectively address said storage means to supply said signal pattern to said VCO means,

signal converter means connected to the output of said pulse width modulator means and operative to produce an output signal which is a function of the duty ratio of the pulse width modulator, and

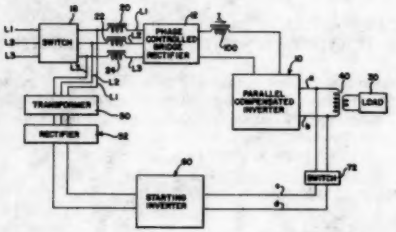
comparator means connected to the output of said signal converter means and operative to compare said output signal with a reference signal and to supply a control signal to said pulse width modulator to control the duty ratio thereof.

4,638,418

POWER INVERTER

Jonathan W. Alexander, Boaz, Ala., assignor to Tocco, Inc., Boaz, Ala.

Filed Aug. 26, 1985, Ser. No. 769,246
Int. Cl.[4] H02P 1/04, 13/20
U.S. Cl. 363—49 **11 Claims**



1. In a power inverter for converting direct current from a constant current supply into alternating current, for use in applications requiring frequent energizations of serial loads having varying Q characteristics, said power inverter including a starter inverter providing initial energization of each said load, said starting inverter having a direct current input from said supply and an alternating current output which may be selectively applied across each load, means responsive to an energization level of said load to remove said starting inverter from said load when a preselected energization level is reached, and means to energize said power inverter in timed relationship with the removal of said starting inverter with said load, said power inverter having an output voltage level below which there is starting instability, the improvement comprising:

means in said power inverter for increasing the apparent Q of the load to be energized, whereby the voltage level of output instability of the power inverter is substantially reduced to a lower output voltage; and,

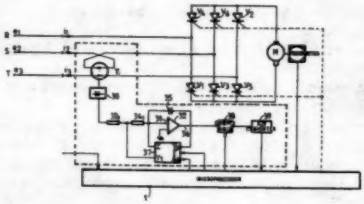
means providing an output voltage at said starting inverter at least as high as said lower output voltage, whereby commutation failure of said power inverter is precluded.

4,638,419

PROCESS AND DEVICE FOR DETERMINING THE MEAN VALUE OF THE CURRENT DELIVERED BY A CONTROLLABLE VALVE RECTIFIER BRIDGE

Jean-Pierre Fauvet, Rueil Malmaison, and Jacques Parisel, Maisons Laffitte, both of France, assignors to La Telemecanique Electrique, France

Filed Jul. 19, 1985, Ser. No. 756,550
Claims priority, application France, Aug. 3, 1984, 84 12321
Int. Cl.[4] H02M 7/04
U.S. Cl. 363—87 **2 Claims**



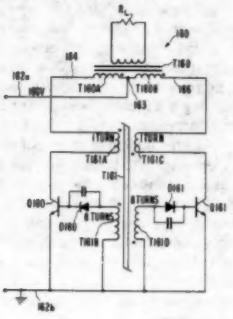
1. A device for determining the mean value of the current delivered by a controlled valve rectifier bridge fed by a three

phase network having first and second and third phase conductors having phase voltages each having a period zone, said first phase conductor having a looped part and said device comprising a current transformer having a primary circuit coupled with said looped part and with said second phase conductor and a secondary circuit which produces a signal representative of the difference between the currents flowing through said first and said second phase conductors, a single full wave rectifier having an input which receives said signal and an output connected to a first resistor, a second resistor serially mounted with said first resistor through a junction point and connected to an integrating assembly formed by an operational amplifier having an integrating input connected to said second resistor and an output connected to said integrating input by a capacitor and by a switching device, one particular of said two resistors having two terminals which are connected to said switching device, a microprocessor adapted for controlling said switching device so as to obtain successive integration cycles of duration equal to the period zones of the phase voltages of the network but phase shifted with respect thereto, for resetting said integrator assembly at the end of each cycle and by short-circuiting said particular resistor to cause the gain of the operational amplifier to pass alternately from a first value to a second value, a sample hold circuit connected to the output of the operational amplifier and controlled by the microprocessor so as to produce sampling at the end of each integration cycle in a time preceeding said resetting, said sample hold circuit having an output connected to an analog digital converter.

4,638,420
APPARATUS FOR MAINTAINING CONSTANT FREQUENCY IN A DC TO SQUARE WAVE INVERTER

Charles O. Forge, Los Altos, Calif., assignor to Boschert Inc., Milpitas, Calif.

Filed Apr. 1, 1985, Ser. No. 717,782
Int. Cl.⁴ H02M 7/537
U.S. Cl. 363—132 **25 Claims**



1. A circuit comprising:

an output transformer having a primary winding and a secondary winding, said secondary winding being adapted to provide a load current;

a transistor having a collector, a base, and an emitter, said emitter being coupled to said primary winding of said output transformer, current through the base of said transistor increasing in response to an increase in said load current;

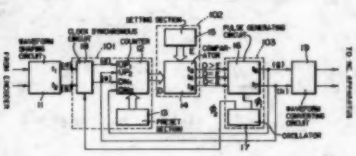
a second transformer having a saturable core, said second transformer being coupled across the base emitter junction of said transistor; and

negative resistance means coupled between said second transformer and the base of said transistor, said negative resistance means tending to cancel the increase in the base emitter voltage drop of said transistor occurring when the load current of said output transformer increases.

4,638,421
POSITION FEEDBACK SYSTEM

Norio Kimizuka; Akira Sogabe, and Mituyosi Abo, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Sep. 14, 1984, Ser. No. 650,542
Claims priority, application Japan, Sep. 14, 1983, 58-169971
Int. Cl.⁴ G05B 9/00
U.S. Cl. 364—167 **9 Claims**



1. A position feedback system adapted to return a detection signal of a measuring device provided on the side of a machine tool to an NC apparatus to determine the working position of the machine tool when the machine tool is controlled by a command signal from said NC apparatus comprising:

a counter means adapted to carry out the up-counting and down-counting of a counting pulse formed on the measuring device side and used to discriminate the direction of movement and detect the amount of movement;

a comparator means for carrying out the comparison between the counted value of said counter means and a predetermined reference value; and

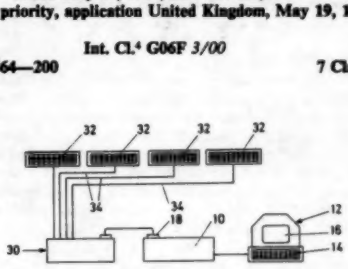
a pulse generating means adapted to output one counting pulse for up-counting or one counting pulse for down-counting to said NC apparatus side at a time period larger than a minimum time period necessary for said NC apparatus side to carry out the signal reading operation, and supply said counting pulse for up-counting as a down-count input to said counter means and return said counting pulse for down-counting as an up-count input to said counter means;

whereby said counting pulse is output from said pulse generating means to said NC apparatus die until said counted value of said counter means becomes the same as the reference value of said comparator means.

4,638,422
DATA ENTRY INTERFACE ASSEMBLY

Elwyn Rees, Maesydd, Llangan, United Kingdom

Filed May 18, 1984, Ser. No. 611,981
Claims priority, application United Kingdom, May 19, 1983, 8313919
Int. Cl.⁴ G06F 3/00
U.S. Cl. 364—200 **7 Claims**



1. An interface assembly enabling a central processing unit to accept and allocate information from a number of remote data entry terminals, which assembly comprises:

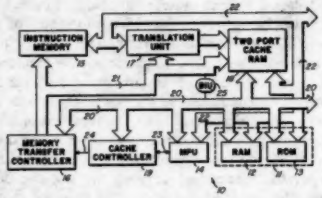
an interface to match the interface convention at an i/o port of the central processing unit;
a memory buffer comprising one byte of memory for each of the remote data entry terminals to be served;
means for supplying data from the said remote data entry terminals to individually assigned bytes of the memory buffer;
an address generator for addressing individual bytes of the said memory buffer in sequence;
means for transferring to the said interface information identifying each individual byte address and the value held by the byte at each said address;
and means for resetting the value of each byte addressed to a null value on such transfer.

4,638,423

EMULATING COMPUTER

Danny B. Ballard, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1985, Ser. No. 708,632
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—200 **22 Claims**



7. A method of emulating a computer comprising the steps of:
transmitting an instruction to a processing unit;
checking a cache memory for a translated instruction;
loading an instruction block into an instruction memory if said translated instruction is not in said cache memory;
translating an instruction of said instruction block providing a translated instruction;
storing said translated instruction in said cache memory; and
transmitting said translated instruction from said cache memory to said processing unit.

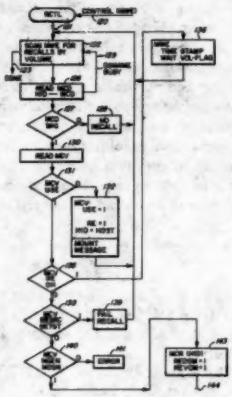
4,638,424

MANAGING DATA STORAGE DEVICES CONNECTED TO A DIGITAL COMPUTER

Thomas W. Beglin; Jane R. Pence; Harvey E. Kamionka, and Jerry W. Pence, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1984, Ser. No. 570,054
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **14 Claims**

1. In the machine-implemented method of operating a data-storage hierarchy having a plurality of primary and secondary data-storage volumes, each of said volumes being addressable and having a given plurality of addressable data-storage areas for respectively storing a predetermined amount of data, each of said primary volumes having relatively rapid-access characteristics for data stored therein while each of said secondary volumes having relatively slow access characteristics for data stored therein, means coupled to said volume for transferring data therebetween;
including the steps of:
transferring data from a first one of said secondary volumes to a first one of said primary volumes for constituting a recall of data stored in said first one secondary volume;
transferring data from a second one of said primary volumes to a second one of said secondary volumes for constituting a migration of data stored in said second one primary volume;
initiating a one of a said migrations of data and a one of said recalls of data, respectively, as a migration step and as a recall step;
upon initiating each said migration step, first determining the accessibility of said second one of said secondary volumes which is to receive and store data to be migrated, upon determining said second one of said secondary volumes is accessible, performing said migration step; upon determining that said second one of said secondary volumes is not accessible, assigning a third one of said secondary volumes to receive and store said data to be migrated and then performing said migration step to said third one of said secondary volumes;
upon initiating a said recell step, first determining the accessibility of said first one of said secondary volumes, if said first one of said secondary volumes is accessible, then performing said recall step, otherwise setting a flag bit indicating that the initiated recall is being delayed;



during said migration step, repeatedly sensing said flag bit for determining if a recall is being delayed; when said flag bit is reset, continuing said migration step, otherwise when the flag bit is set, determining if said second one of said secondary volumes is to be said first one of said secondary volumes; if not, continuing the migration step, otherwise selecting a fourth one of said secondary volumes to receive a remaining portion of the data to be migrated and continuing said migration step with said fourth one of said secondary volumes for receiving and storing said remaining portion; and
then performing said recall step with said second one of said secondary volumes.

4,638,425

PERIPHERAL DATA STORAGE HAVING ACCESS CONTROLS WITH ERROR RECOVERY

Michael H. Hartung, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 426,367, Sep. 29, 1982, Pat. No. 4,574,346. This application Nov. 20, 1985, Ser. No. 800,177
Int. Cl.[4] G06F *13/00, 12/08*
U.S. Cl. 364—200 **20 Claims**

1. The machine-implemented method of operating a data-storage system connecting to a host and having a volatile front store and a retentive back store, each store having a plurality of addressable data storage areas; means for enabling all data stored in said front store and said back store to be addressable by addresses of data storage areas of said back store;

including the steps of:

establishing a zone of data volatility in said front store identifiable by designated ones of said data storage area addresses;

storing data in said front store identifiable as being within said zone of volatility (exempted data) and signalling completion of data storage operations to said host without storing said exempted data as retentive data in said back store;

monitoring operation of said front store with respect to said zone of volatility;

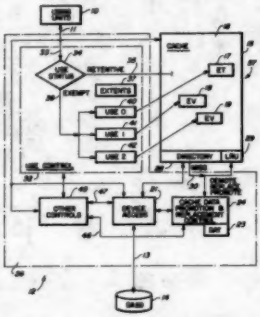
for each data storage operation which stores data outside said zone of data volatility in the datastorage system received from a host, always first storing such data as retentive data in said back store before signalling completion of said data storage operation to said host;

during said monitoring, detecting a loss of said exempted data in said data-storage system stored within said zone of volatility and then inhibiting access to the exempted data stored in said front store within said zone of volatility;

signalling said host that in error has occurred relating to said zone of volatility;

in said host, performing error recovery related to and for said loss of exempted data, sending a message from said host to the data storage system that the host has recovered from said signalled error; and

receiving from said message and then again permitting access by said host to said zone of volatility.



4,638,426

VIRTUAL MEMORY ADDRESS TRANSLATION MECHANISM WITH CONTROLLED DATA PERSISTENCE

Albert Chang, Yorktown Heights; John Cocke, Bedford; Mark F. Mergen, Mount Kisco, and George Radin, Piermont, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US82/01829, § 371 Date Sep. 19, 1983, § 102(e) Date Sep. 19, 1983, PCT Pub. No. WO84/02784, PCT Pub. Date Jul. 19, 1984

PCT Filed Dec. 30, 1982, Ser. No. 573,975

Int. Cl.⁴ G06F *12/10*

U.S. Cl. 364—200 **12 Claims**

1. A method for converting virtual memory addresses supplied by an associated central processing unit into real memory addresses within a large hierarachical memory system wherein the virtual memory address space is significantly larger than the actual memory which method comprises;

the CPU generating a first virtual address comprising a segment identifier field, a page offset field, and a byte offset field,

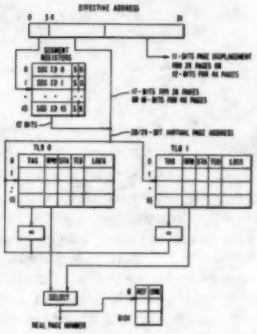
utilizing the segment identifier field to access a set of segment registers pointed to by the segment identifier field,

accessing the contents of the addressed segment register and concatenating the contents of same with the page offset and byte offset fields of said first virtual address to form a significantly larger second virtual address, wherein portions of said second virtual address obtained from said segment registers and the page offset portion of said first virtual address comprise a virtual page address to be utilized as a search argument in a subsequent address translation procedure which procedure comprises

utilizing a subset of said virtual page address as the search argument in a set of high speed translation-look-aside buffers,

comparing a complete virtual address stored at an accessed location of said translation look-aside buffers with the complete virtual address utilized as the search argument and accessing an associated real page address in the main memory from the translation look-aside buffers if the virtual address comparison is successful,

in the event of an unsuccessful search for the virtual address



in said translation look-aside buffers, continuing the search in a specified segment of storage in main memory (page frame tables) including

hashing said virtual page address,

accessing the page frame tables in main memory as a function at said hashed address, determining if the desired virtual address is at the hashed address and if not

determining if the hashed address is the initial member of a linked list of virtual addresses, all of which would produce the same hashed address,

continuing the search for the desired virtual address in said linked address list in said page frame tables until either the desired complete virtual address is found or it is determined that no such address is present,

accessing the real page address associated with said complete virtual page address, if found, in said page frame tables and utilizing said real page address as the requested real memory address.

4,638,427

PERFORMANCE EVALUATION FOR AN ASYMMETRIC MULTIPROCESSOR SYSTEM

Daniel B. Martin, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,622

Int. Cl.⁴ G06F *15/16, 9/44*

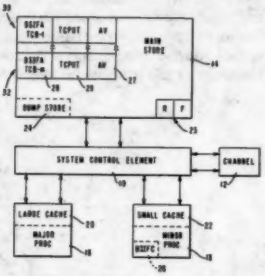
U.S. Cl. 364—200 **16 Claims**

1. A method for adjusting CPU usage time in an asymmetric multiprocessor system (AMP) having at least one major processor and at least one minor processor, the minor processor being designed to execute without emulation a subset of instructions executable also without emulation by the major processor, and other instructions being executable with emulation by the minor processor but being executable without emulation on the major processor, each processor executing dispatched program tasks, each task comprised of a plurality of

the major processor's instructions, the processors being capable of interchanging the execution of any task in the AMP, the method comprising the steps of:

determining a real time measurement for each task that executes on the major processor and on the minor processor,

generating an adjusted time value for each task that executes on the minor processor by modifying the real time measurement for the minor processor according to emulation characteristics of the minor processor for tasks executed on the minor processor,



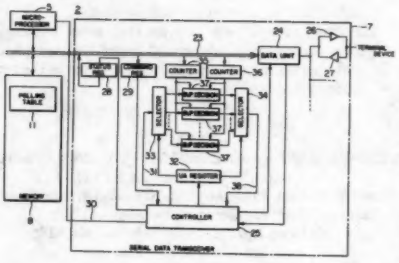
accumulating an adjusted total time value for the minor processor by summing the adjusted time values for all tasks executed on the minor processor over a given set of tasks or over a time period, and accumulating an actual total time value for the major processor by summing the real time measurements for all tasks executed on the major processor over a given set of tasks or over a time period, essentially the same amount of data processing being represented by a unit of the actual total time value for the major processor and by a unit of the adjusted total time value for the minor processor.

4,638,428

POLLING CONTROL METHOD AND SYSTEM

Hideaki Gemma, and Masafumi Hino, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1984, Ser. No. 681,028
Claims priority, application Japan, Dec. 14, 1983, 58-235298
Int. Cl.[4] G06F *13/22*
U.S. Cl. 364—200 **7 Claims**



1. A polling method in a control unit having a plurality of terminal device address for a plurality of terminal devices comprising the steps of:

sequentially polling to said terminal device addresses;

counting the number of times of non-response to the polling for each of said terminal device addresses; and

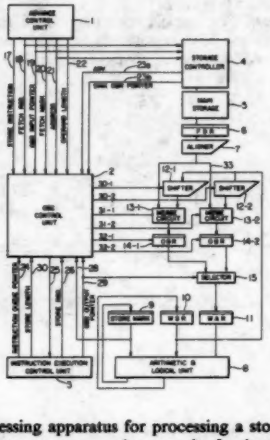
partially suppressing the polling to the terminal device address when said count for said terminal device address exceeds a predetermined number.

4,638,429

DATA PROCESSING APPARATUS FOR PROCESSING OPERAND STORE CONFLICT

Masaya Watabe, and Shuichi Abe, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,999
Claims priority, application Japan, Dec. 19, 1983, 58-239504
Int. Cl.[4] G06F *9/34*
U.S. Cl. 364—200 **7 Claims**



1. A data processing apparatus for processing a store-type instruction which stores an operand as a result of an instruction execution in a storage location of a storage and a fetch-type instruction which fetches an operand from a storage location, comprsing:

a detecting means for detecting that an execution result of said store-type instruction for which a store operation has not been completed is utilized as an operand of said fetch-type instruction which succeeds said store-type instruction; and

a control means for aligning an operand position with the operand fetched by said fetch-type instruction and for merging an store operand in response to a detection by said detecting means and a store operation for storing said execution result.

4,638,430

EAROM AND EEPROM DATA STORAGE MANAGEMENT

Raymond C. Perra, Windsor Locks; Stephen B. Wilmot, Farmington, and John E. Games, Granby, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

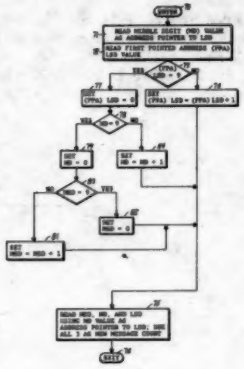
Filed Jul. 15, 1983, Ser. No. 514,214
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—300 **4 Claims**

1. A method of recording successive values of high sample frequency parameters in a nonvolatile memory having a plurality of addressable signal storage locations for storing digital data recorded therein over a maximum number of recording cycles, comprising the steps of:

identifying a data signal block for each high sample frequency parameter as including a plurality of addressable storage locations at least equal to the ratio of the predicted number of recordings of each high sample frequency parameter in a selected lifetime interval, divided by the maximum number of recording cycles specified for each location; and

recording successive values of sample data in alternate ones

of the data block signal locations so as to limit the number of recordings in each location to a number which is not greater than the maximum number of recording cycles specified.



4,638,431

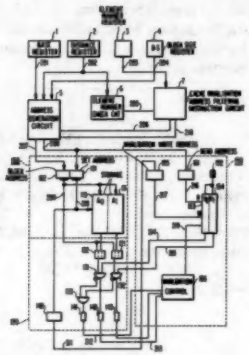
DATA PROCESSING SYSTEM FOR VECTOR PROCESSING HAVING A CACHE INVALIDATION CONTROL UNIT

Hiroyuki Nishimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,369

Int. Cl.[4] G06F *12/08, 12/00, 13/00*

U.S. Cl. 364—200 **2 Claims**



1. In a data processing system for vector data processing and scalar data processing including:

a main memory;

parallel vector operation means for performing vector data processing, having a plurality of interfaces to said main memory for accessing element data; and

scalar operation means for performing scalar data processing, having a cache memory unit coupled to said main memory;

a cache memory unit, associated with said scalar operation means, comprising:

a cache memory for storing groups of data;

cache directory means for holding block address data associated with data stored in said cache memory; and

cache invalidation control means for invalidating an address of said cache directory;

said cache invalidation control means comprising:

address generation means for generating cache invalidation addresses corresponding to store addresses of vector element data for vector store instructions which define a start address, a distance between element data, and a number of vector store elements, indicated by said vector store instructions;

detection means for checking whether or not a block address including said cache invalidation addresses which are applied to said detection means from said address generation means is filed in the cache directory or a copy of the cache directory and, if filed, generating a coincidence signal;

invalidation means for invalidating an associated filed address of the cache directory in response to the coincidence signal outputted from said detection means;

element number check means for checking a number of vector elements contained in a block by checking a distance between the vector store elements in said block and generating a signal corresponding to the number of vector elements in and the size of said block; and

cache invalidation address filtering instruction means for delivering an instruction to said address generation means to filter out said cache invalidation address in response to the output of the element number check means.

4,638,432

APPARATUS FOR CONTROLLING THE TRANSFER OF INTERRUPT SIGNALS IN DATA PROCESSORS

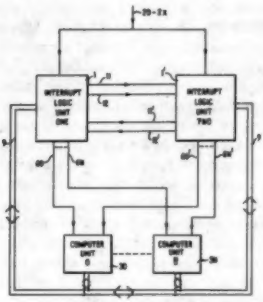
John A. Niblock, Nuneaton; Jayant Patel, Coventry; Dennis Fisher, Tipton, and Anthony P. Lumb, Nuneaton, all of England, assignors to The General Electric Company, p.l.c., England

Filed Apr. 9, 1984, Ser. No. 598,469

Claims priority, application United Kingdom, Apr. 13, 1983, 8310003

Int. Cl.[4] G06F *11/00, 11/30, 13/24*

U.S. Cl. 364—200 **5 Claims**



1. Input signal handling apparatus for controlling the transfer of input signals to a data processor, wherein two input signal units are provided one of which is selected as an active unit and the other of which is selected as a monitoring unit, and each of which has a plurality of inputs each arranged for connection to a respective source of input signals, an output for connection to a data processor, a data store which stores each signal received on one of said inputs, and control means which compares each signal so received and stored with presettable criteria which determine whether the received signal is an immediate input signal and, if so, causes all said input signals currently stored in the active input signal unit to be passed to its respective output and the subsequent erasure of those input signals, whereby all input signals received and stored as aforesaid are transferred to a connected data processor, and wherein on occurrence of an immediate input signal, the monitoring

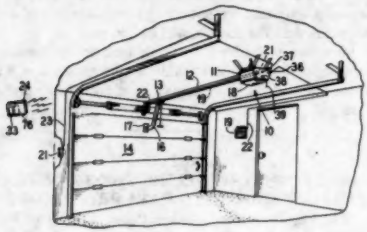
input signal unit monitors an output of the active input signal unit to determine whether that unit has acted to transfer input signals in the manner aforesaid and, if so, erases corresponding input signals from its respective data store and, if not, causes those corresponding input signals to be transferred to its respective output such that the input signals for transfer to a connected data processor are not lost if one of the input signal units fails.

4,638,433

MICROPROCESSOR CONTROLLED GARAGE DOOR OPERATOR

Wayne R. Schindler, Lisle, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed May 30, 1984, Ser. No. 615,339
Int. Cl.[4] G06F *15/20*; H02P *1/22*; E05F *11/00, 15/10*
U.S. Cl. 364—400 **2 Claims**



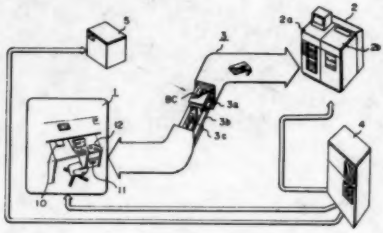
1. A garage door operator for a garage door comprising, a motor with an output shaft connected to said garage door to open and close it, a control unit with an energize switch and up and down setting switches, a microprocessor connected to said control unit and to said motor to energize it, a program switch settable to operate and program positions and connected to said microprocessor, a rotation detector mounted so as to monitor rotation and direction of rotation of the output shaft of said motor, and said rotation detector connected to supply an input to said microprocessor when said program switch is in the program position, and the motor will move in the down direction when said down setting switch is energized and the motor will move in the up direction when said up setting switch is energized and down and up limits will be set when the door has been moved, and means for automatically setting the force limits connected to said microprocessor to set the force limits when the garage door is initially operated, wherein a radio receiver is connected to said microprocessor and a radio transmitter is capable of transmitting a signal to energize said radio receiver to operate said door, including a door condition indicator connected to said microprocessor and energized when a problem exists with the door and the garage door operation, wherein said radio transmitter when energized radiates a coded signal and said radio receiver receives and detects said coded signal, means for storing a stored coded signal at said receiver, said microprocessor receiving and comparing said coded signal with said stored coded signal, and said microprocessor producing a garage door operator signal if said transmitted coded signal and said stored coded signal are the same, wherein said means for storing is a memory means into which the coded signal from the transmitter can be supplied so as to change the stored coded signal in said means for storing, wherein said means for storing is a multicontact switch which can be manually set, wherein said door condition indicator produces an intermittent output when there is a fault in the garage door operator and said indicator produces a continuous output when the mechanical condition of the door is improper, and including a one inch obstruction switch connected to said microprocessor to set a one inch reversal limit.

4,638,434

CASH PROCESSING SYSTEM

Yoshihiko Aizaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 30, 1984, Ser. No. 676,990
Claims priority, application Japan, Nov. 30, 1983, 58-225692; Nov. 30, 1983, 58-225694
Int. Cl.[4] G06F *15/22, 15/20, 15/30*
U.S. Cl. 364—401 **19 Claims**



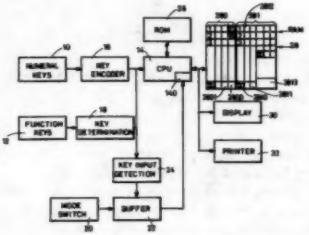
1. A cash processing system comprising:
a transaction terminal having opening means for taking out and putting in cash, and means for demanding the payment or receipt of cash;
a cashier terminal which is provided separately from the transaction terminal to effect the payment and receipt of the cash;
passage means for connecting the transaction terminal and the cashier terminal;
carriage means capable of moving along and on the passage means for conveying the cash between the terminals;
a system controller for controlling the receipt and payment of the cash by the cashier terminal, in response to a demand from the transaction terminal; and,
a conveyance controller for controlling the conveyance of the cash by the carriage means in accordance with outputs from the system controller.

4,638,435

ELECTRONIC CASH REGISTER HAVING DIRECT PRICE LOOK-UP FUNCTION

Kumehiko Matsuda, Jyoyo, and Kensaku Komai, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1983, Ser. No. 564,205
Claims priority, application Japan, Dec. 27, 1982, 57-231087
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—405 **1 Claim**



1. In an electronic cash register including a plurality of department keys for introducing department access code information, a plurality of numeral keys for introducing numeral data, and a PLU instruction key for instructing a PLU (price look-up) operation, the improvement comprising:

memory means for storing preset data and registered data, said memory means including,

a first memory section storing a plurality of price look-up codes and unit cost information associated with each price look-up code, and

a second memory section storing a pluraity of department access codes each department access code being associated with one of said plurality of department keys, and a selected number of said plurality of price look-up codes, each of said selected number of said plurality of price look-up codes corresponding to one of said plurality of department access codes;

mode select means for choosing an operation for the electronic cash register from at least two operation modes including a price look-up registration mode and a direct price look-up mode;

processing means, responsive to said mode select means, for carrying out the operation chosen by said mode select means, where in said direct price look-up mode said processing means is responsive to an entered department key, said processing means accessing said second memory section and identifying a department access code corresponding to said entered department key, said processing means identifying a price look-up code corresponding to the department access code, and said processing means accessing a unit cost information associated with the price look-up code in said first memory section, and in said price look-up registration mode, said processing means is responsive to said numeral keys and the PLU instruction key, said processing means receiving a price look-up code entered with said numeral keys, said processing means accessing the unit cost information associated with said entered price look-up code from said first memory section.

4,638,436

TEMPERATURE CONTROL AND ANALYSIS SYSTEM FOR HYPERTHERMIA TREATMENT

Christopher W. Badger; Everette C. Burdette, both of Champaign, Ill.; Steven C. Leech, Tinton Falls, N.J., and John F. McCarthy, Champaign, Ill., assignors to Labthermics Technologies, Inc., Champaign, Ill.

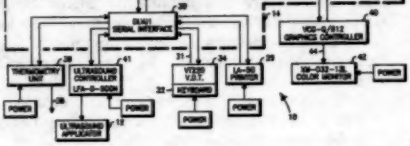
Filed Sep. 24, 1984, Ser. No. 654,603

Int. Cl.[4] G06F 15/42; A61F 7/00; A61N 1/08

U.S. Cl. 364—414 **46 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 48 Pages)



1. A system for controlling a hyperthermia treatment device of the type which has applicator means for applying energy to attain a predetermined temperature protocol for portions of a patient's body, the system monitoring said energy application and being capable of adjusting said energy application responsive to operator manipulation, said system comprising:

means for sensing temperature of the patient's body and for providing a temperature signal;

computer means having associated instruction and data storage means for interacting with other systems means to perform the energy application, said computer means monitoring said temperature signal and adjusting said energy application responsive to the operator manipulation and having data and instructions defining said predetermined temperature protocol, said computer means utilizing said temperature signal and said protocol defining data and instructions to selectively provide an operator prompt signal indicating the desirability of the operator adjusting said energy application and further providing correlative temperature data associated with said portions of the patient's body;

operator means responsive to the operator manipulation for providing an operator signal to control said energy applicator means via said computer means; and

means responsive to said correlative data and said protocol defining data and instructions for displaying a video presentation of said correlative temperature data to the operator, said correlative temperature data displayed in a color coded manner such that preselected colors represent predetermined temperature effectiveness zones of hyperthermia treatment, the operator capable of adjusting said energy application by evaluating said color coded video presentation and providing said operator signal.

4. The system as defined in claim 1 wherein said correlative temperature data comprises selectively at least one of temperature data from (a) a group of said sensing means inside a tumor region, (b) a group of said sensing means outside said tumor region, (c) a mixture of groups from inside and outside said tumor region, (d) a group of said temperature sensing means within said preselected subelement wherein said system is adapted to control the temperature, and (e) a group of said temperature sensing means within and without each said preselected subelement wherein said system is adapted to control the temperature.

20. A method for preparing a predetermined hyperthermia treatment protocol for a tumor in a portion of a patient's body using a hyperthermia treatment data base defining a plurality of general hyperthermia treatment protocols, comprising the steps of:

identifying location, size and type characteristics of said tumor in the patient's body;

mapping data in said hyperthermia treatment data base corresponding to tumor characteristics identified in said patient's body; and

modifying a selected one of said general hyperthermia treatment protocols for said tumor to account for said identified location, size and type characteristics of said tumor in said patient's body to develop said predetermined hyperthermia treatment protocol.

35. A method of determining figures of merit for use in a hyperthermia treatment of a tumor in a portion of a patient's body using an apparatus having a group of temperature sensors disposed in the tumor and another group of temperature sensors disposed in surrounding normal tissue, comprising the steps of;

applying energy to heat said portion of the patient's body;

sensing temperatures periodically throughout said hyperthermia treatment for said group of temperature sensors disposed in said tumor and said group in said surrounding normal tissue;

storing in storage means said sensed temperatures for each said group of temperature sensors;

assigning a temperature threshold zone to each said sensed temperatures;

determining percentages for each said group of said sensed temperatures which lie within each said temperature threshold zone; and

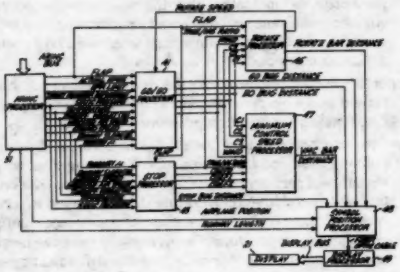
calculating said figures of merit by comparing selected ones of said determined percentages associated with said temperature threshold zones.

4,638,437

AIRCRAFT PERFORMANCE MARGIN INDICATOR

Patrick J. Cleary, Federal Way; Lloyd S. Kelman, Redmond, and Richard L. Horn, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 25, 1984, Ser. No. 624,280
Int. Cl.[4] G06F 15/50
U.S. Cl. 364—427 18 Claims



1. An aircraft performance margin indicator for informing the pilot of an aircraft, during takeoff and landing, of the ability of the aircraft to stop safely or achieve a safe flying speed before reaching the end of the runway comprising:

(a) a two-part display, one part of the display including a GO bug symbol and the other part of said display including a STOP bug symbol; and,

(b) a display control system connected to said two-part display for continuously:

(1) receiving data about the aircraft, the runway and the existing environmental condition;

(2) determining the runway distance needed for the aircraft to both: (i) stop safely if maximum braking is applied; and (ii), achieve a safe flying speed if maximum thrust is applied;

(3) producing GO and STOP bug signals suitable for controlling the position of said GO and STOP bug symbols such that the position of said STOP bug symbol depicts the ability of the aircraft to stop safely before reaching the end of the runway if maximum braking is applied and the position of said GO bug symbol depicts the ability of the aircraft to achieve a safe flying speed before reaching the end of the runway if maximum thrust is applied; and,

(4) applying said GO and STOP bug signals to said two-part display to control the position of said GO and STOP bug symbols.

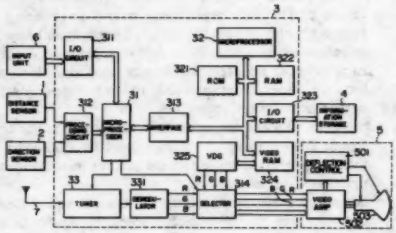
4,638,438

NAVIGATION APPARATUS FOR AUTOMOTIVE

Akira Endo, Mito; Jiro Takezaki, Katsuta; Fumio Tsujii, Mito, and Takanori Shibata, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,856
Claims priority, application Japan, May 23, 1983, 58-89141
Int. Cl.[4] G06F 15/50; G09B 29/10
U.S. Cl. 364—449 5 Claims

1. A navigation apparatus for an automotive vehicle, comprising: sensor means for sensing the travelled distance of a vehicle, sensor means for sensing the advancing direction of the vehicle, information storage means for storing map data, signal processor means for computing the present position of the vehicle on the basis of the output signals from said travelled distance sensor means and said advancing direction sensor means and for generating a display signal including the data of the computed present position of the vehicle and the map data corresponding to said vehicle's present position as read out from said information storage means, and display means for displaying said dispaly signal, wherein said map data is stored in the form of position coordinate information of division points dividing roads on the road map into sections that can be approximated by linear interpolation between division points,



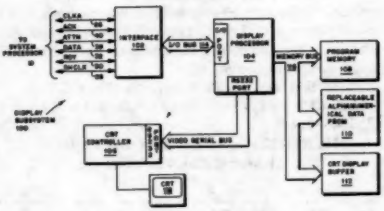
and wherein said signal processor means comprises means for effecting linear interpolation of said map data stored in said information storage means in the form of said position coordinate information of division points to generate said display signal.

4,638,439

POSTAGE METERING SYSTEM WITH DISPLAY

Edward P. Daniels, Bridgeport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 5, 1983, Ser. No. 491,843
Int. Cl.[4] G07B 17/02; G06F 15/20
U.S. Cl. 364—446 6 Claims



1. A postage metering system comprising

(a) postal scale means for determing postage values for items to be mailed as a function of the weight of said items and additional information entered by an operator, said postage values comprising a plurality of components;

(b) a peripheral display subsystem connectable to said postal scale means, said subsystem further comprising:

(b1) display means for displaying alphanumeric information;

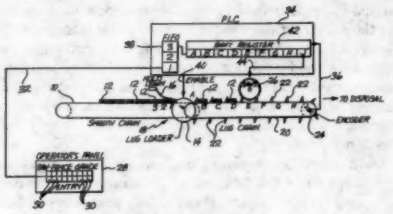
(b2) memory means for storing data, said data including data defining alphanumeric information describing said components of said postage values

(b3) display processor means operatively connected to said display means and said memory means, and connectable to said postal scale means, for receiving from said postal scale means signals identifying and defining said components of said postage values, for matching said describing alphanumeric information with said components, and for controlling said display means so that said describing information is displayed in predetermined alphanumeric format.

4,638,440
FEEDING AND DATA ENTRY SYSTEM FOR LUMBER TRIMMER

William R. Brough, Federal Way, and James C. Borgen, Aberdeen, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 218,852, Dec. 22, 1980, abandoned.
This application Oct. 1, 1984, Ser. No. 656,415
Int. Cl.[4] G06F *15/46*; G05B *19/19*
U.S. Cl. 364—475 10 Claims



1. A feeding and data entry system for a lumber trimmer, comprising:

a first conveyor means for bringing marked boards to a data entry zone where each board makes at least one step within the zone,

a second conveyor means for accepting boards from the first conveyor means,

a data processing and control means for receiving and sending data,

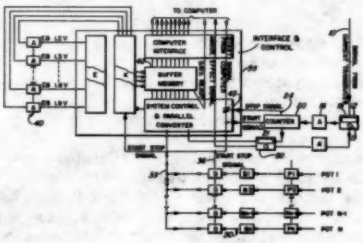
a loader means for transferring each board to the second conveyor means only after data is entered into the data processing and control means indicative of at least the decision of the location of trimming cuts, and

means for tracking each board as it moves on the second conveyor means into the trimmer and for activating the selected saws to make the trim cuts.

4,638,441
DATA ACQUISITION SYSTEM FOR THE COMPUTER CONTROL OF ALUMINUM SMELTERS

Andrew E. Deczky, Ottawa, Canada, assignor to R.F.J. Associates Limited, Scarborough, Canada, a part interest

Filed May 31, 1984, Ser. No. 615,730
Claims priority, application Canada, Jan. 18, 1984, 445554
Int. Cl.[4] G01R *19/00*; C25C *3/00, 3/06, 3/20*
U.S. Cl. 364—483 10 Claims



1. A method of measuring current independent corrected cell potentials in an aluminum potline having a plurality of cells connected in series, comprising:

(a) generating a first signal having a frequency proportional to current through said cells, said signal having a predetermined frequency when said current is at a set-point value,

(b) determining a time interval by counting cycles of said first signal from a start time until a predetermined count value is reached,

(c) generating a plurality of second signals each having a frequency proportional to total voltage across a different one of said cells,

(d) generating a plurality of third signals each having a frequency proportional to different possible values of back e.m.f. of a cell,

(e) counting cycles of said second signals during said time interval to obtain counts proportional to current independent total cell voltages,

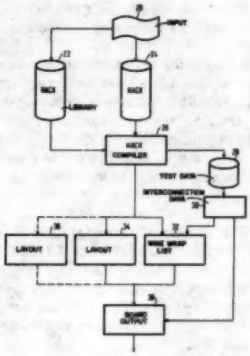
(f) using said third signals to decrement, during said time interval, counters having counts proportional to the different possible values of back e.m.f. to thereby determine any error values that might exist for the back e.m.f. values as a result of a change in said current from its set-point value, and

(g) algebraically subtracting the error values determined in step (f) from the current independent total cell voltages to determine current independent corrected cell voltages.

4,638,442
COMPUTER AIDED DESIGN METHOD AND APPARATUS COMPRISING MEANS FOR AUTOMATICALLY GENERATING PIN-TO-PIN INTERCONNECTION LISTS BETWEEN RESPECTIVE DISCRETE ELECTRICAL COMPONENT CIRCUITS

Stewart F. Bryant, Redhill; Stephen J. Baker, Brighton, and Richard A. Cook, Haywards Heath, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1984, Ser. No. 669,207
Claims priority, application United Kingdom, Nov. 9, 1983, 8329888
Int. Cl.[4] G06F *15/60*
U.S. Cl. 364—489 9 Claims



1. An arrangement for generating a component interconnection list for an electrical circuit, each interconnection being in the form of a link between a first individual component pin and a second individual component pin, said arrangement comprising means for entering

a component list containing any component used,

a component description of any component used inclusive of a functional pin description thereof, and

a circuit interconnection description containing elements of the form of a first array of pins of a second array of named components connected to a third array of pins of a fourth array of named components, at least one array being non-unitary,

wherein for any circuit interconnection description element in which both said first and said third arrays are non-unitary the first and third arrays have equal numbers of array elements, said arrangement furthermore containing library means for storing said component descriptions as standard component descriptions, processing means for processing, under program control, the circuit interconnection description and the list of

components used while addressing said library means for accessing said component descriptions, and output means for after said processing outputting said component interconnection list.

4,638,443

GAS DETECTING APPARATUS

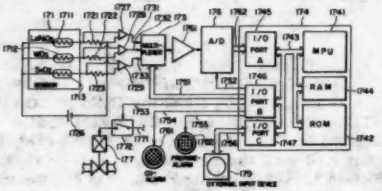
Masayoshi Kaneyasu; Hideo Arima, both of Yokohama; Mitsuko Ito, Yokosuka; Shoichi Iwanaga, Yokohama; Nobuo Sato, Yokosuka; Takanobu Noro; Akira Ikagami, both of Yokohama, and Tokio Isogai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,667

Claims priority, application Japan, Feb. 21, 1983, 58-26166

Int. Cl.[4] G01N *27/12*; **G06F** *15/20*; **G08B** *17/10*

U.S. Cl. 364—497 **7 Claims**



1. A gas detecting apparatus comprising:

a plurality of gas detecting semiconductor elements having gas detection characteristics differing from one another;

storage means for storing a plurality of standard patterns prepared by measuring previously the gas detection characteristics of said gas detecting semiconductor elements in dependence on species of gas components and mixing ratios thereof and patterning the measured detection characteristics; and

arithmetic means for arithmetically processing gas detection outputs of said plural gas detecting semiconductor elements, said arithmetic means including means for comparing a detected pattern reproduced from gas detection outputs of said plural gas detecting semiconductor elements with said standard patterns stored in said storage means for identifying the species of a gas to be detected.

4,638,444

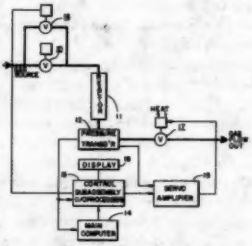
MICROPROCESSOR-CONTROLLED BACK-PRESSURE SYSTEM FOR SMALL VOLUME CHEMICAL ANALYSIS APPLICATIONS

Robert Laragione, Christiana; Steven M. Lurcott, West Chester, both of Pa.; Woodford A. Bowe, Rising Sun, Md., and Eugene J. Levy, Oxford, Pa., assignors to Chemical Data Systems, Inc., Oxford, Pa.

Filed Feb. 17, 1983, Ser. No. 467,461

Int. Cl.[4] G05B *11/00*

U.S. Cl. 364—510 **18 Claims**



1. A system for maintaining back-pressure in a low flow, low volume chemical testing apparatus, said apparatus including a chamber having input and output ends and in which pressure is to be maintained, means for applying at least one gas to the input end of said chamber, transducer means for measuring the pressure of said gas at the output end of said chamber and producing a first signal corresponding thereto, means downstream of said transducer for adjusting the back pressure of said chamber, means for producing a second signal corresponding to the magnitude of a desired back Pressure within said chamber, a microprocessor-based control subassembly coupled to receive said second signal from said signal-producing means and to receive said first signal from said measuring means transducer, said subassembly producing a modified set-point signal in response to said two signals indicating the departure of the actual pressure as measured by said transducer from said desired back pressure, servo means for comparing said first signal and said modified set point signal for producing a difference error signal and supplying the latter to regulate said means for adjusting the back pressure thereby to cause the pressure within said chamber to approach closely the desired back pressure;

said means for applying said gas including a first automatically-operated flow valve in parallel with a second fast-acting prepressure flow valve, said second flow valve enabling said chamber to be quickly filled to approach the desired pressure at start up of said system; and

said control subassembly including means for producing a third signal which is applied to said second valve for opening said second valve when the actual pressure in said chamber as measured by said transducer deviates by more than a predetermined amount from the desired set-point pressure.

4,638,445

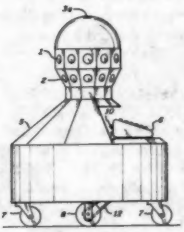
AUTONOMOUS MOBILE ROBOT

Paul J. Mattaboni, 9 Wildwood Dr., Medfield, Mass. 02052

Filed Jun. 8, 1984, Ser. No. 618,438

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—513 **6 Claims**



1. In a mobile robot of the type having

(a) a vision system,

(b) memory means for storing data derived from the robot vision system, and

(c) a computer for processing data derived from the robot's vision system,

the improvement wherein the robot's vision system comprises

(i) a first array of ranging transducers for obtaining data on the position and distance of far objects in a volume of space, the transducers of the first array being symmetrically disposed on the mobile robot with respect to an axis of symmetry within the mobile robot, each transducer of the first array being fixed in position with respect to that axis of symmetry and seeing a portion of the volume of space seen by its entire array;

(ii) a second array of ranging transducers for obtaining data of the position and distance of near objects in the same or an overlapping volume of space, the transducers of the second array being symmetrically disposed on the mobile robot with respect to said axis of symmetry, each transducer of the second array being fixed in position with respect to said axis of symmetry and seeing a portion of

the volume of space seen by its entire array, the angle of view of the transducers of the second array being different from the angle of view of the transducers of the first array with respect to the same object in space; and

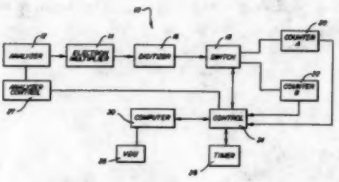
(iii) means for polling said ranging transducers in sequences determined by the computer.

4,638,446

APPARATUS AND METHOD FOR REDUCING TOPOGRAPHICAL EFFECTS IN AN AUGER IMAGE

Paul W. Palmberg, Bloomington, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 31, 1983, Ser. No. 499,596
Int. Cl.[4] H01J *39/00*
U.S. Cl. 364—555 **6 Claims**



1. A system for reducing topographical effects in forming an Auger image by sequentially focusing a primary electron source at points along a line of a raster pattern, said system comprising:

an electron analyzer, said analyzer having means for selectively passing electrons therethrough at a first preselected energy level and at a second preselected energy level, said analyzer producing a signal responsive to the passage therethrough of said electrons;

means for digitizing said signal from said analyzer;

first and second digital counters, each said counter being switchably connected to said digitizing means;

a timer;

control means having first means for connecting said first counter to said digitizing means and for setting said electron analyzer at said first energy level and for activating said timer to determine the time interval to bring the signal in the first counter to a preselected value, and said control means having second means for connecting said second counter to said digitizing means and for setting said electron analyzer at said second energy level to ascertain the signal in the second counter after the lapse of the same time interval;

means for calculating the difference between the count in said first counter and the count in said second counter;

means for displaying said difference in said counters; and

means for refocusing said primary electron source on the next adjacent point along said line of the raster pattern.

4,638,447

METHOD FOR DETERMINING CONSISTENT OIL RELATIVE PERMEABILITY VALUES FROM DYNAMIC DISPLACEMENT DATA

Aziz S. Odeh, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,175
Int. Cl.[4] G01N *15/08*
U.S. Cl. 364—556 **7 Claims**

1. A method for determining correct relative oil permeability values for a core sample, comprising the steps of:

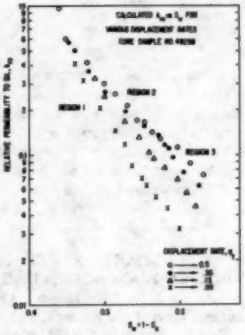
performing oil flood dynamic displacement measurements on said core sample;

determining characteristics of said core sample;

determining from data collected during said measurements, and from said characteristics of said core sample, relative oil permeability values (k_{ro}) for said core, said determined relative oil permeability values (k_{ro}) being offset from correct relative oil permeability values (k_{roc}) as a result of an end effect which introduces an increased fluid pressure drop at an effluent end of said core sample; and

correcting said determined relative oil permeability (k_{ro}) values toward said correct relative oil permeability values (k_{roc}) thereby minimizing the effects caused by said end effect on said determined relative oil permeability values (k_{ro}), and wherein said correcting step comprises the steps of:

initially plotting a ratio q_o/k_{ro} vs. average fluid saturation of said core sample, where q_o is the rate of oil produced at the effluent end of said core sample during said oil flood dynamic displacement measurements;



determining an initial relative oil permeability value (k_{roi}) at a residual water saturation of said core sample, said value (k_{roi}) being used to determine the first point of the plot of q_o/k_{ro} vs. average fluid saturation;

determining if a straight line segment exists in said plotted ratio in areas thereof corresponding to high oil saturation and, if so, drawing and extrapolating said straight line segment to the limit of the plotted data, otherwise, constructing a tangent curve to the plotted ratio beginning at the point corresponding to k_{roi}; and

determining corrected relative permeability values k_{roc}, where

$$k_{roc} = k_{ro}\frac{(q_o/k_{ro})}{(q_o/k_{ro})SL}$$

and (q_o/k_{ro}) is the initially plotted ratio and $(q_o/k_{ro})SL$ is the value appearing on the drawn and extrapolated straight line segment or the constructed tangent curve for the same average fluid saturation value.

4,638,448

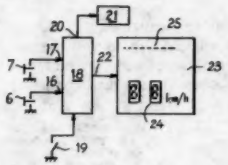
ELECTRONIC ODOMETER IN PARTICULAR FOR A CYCLE

Antoine L. Cuvelier, and Guy M. G. Boucher, both of Paris, France, assignors to Huret et ses Fils, Nanterre, France

Filed Sep. 12, 1983, Ser. No. 531,754
Claims priority, application France, Sep. 15, 1982, 82 15593
Int. Cl.[4] G06M *3/06*; G01C *22/00*; B62J *39/00*; G06F *15/02*
U.S. Cl. 364—565 **13 Claims**

1. An electronic odometer in particular for a cycle, comprising a case having a bottom and a cover pivotally mounted on said bottom, a micro-processor in the case, a sensor of movements for associating with a wheel of the cycle and connected to the micro-processor, display means connected to said micro-processor for displaying items of information, such as distance, speed of time information, a signal generator connected to said

micro-processor and adapted for identifying under the control of said micro-processor the nature of said items of information displayed on said display means, and at least a first control key relating to the display of items of information processed in the micro-processor, said first control key being constituted by said cover of the case, said signal generator emitting signals respectively corresponding to the nature of the items of information displayed on said display means, a switch adapted to control through said micro-processor main functions of the odometer, said switch being associated with said first control key and connected to the micro-processor, the actuation of said switch resulting in the display of items of information processed by said micro-processor and the emission by the signal generator of signals characterizing the displayed items of information.



4,638,449

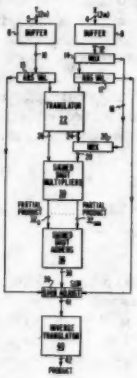
MULTIPLIER ARCHITECTURE

Alexander H. Frey, Cabin John, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 504,358, Jun. 15, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 765,567

Int. Cl.[4] G06F 7/52

U.S. Cl. 364—760 **2 Claims**



1. An improved multiplier for multiplying a first operand Y times a second operand X, comprising:

a Booth-type translator having an input connected to receive the first operand Y having 2N binary bits Y_j, for translating the binary expression for the sequence of N pairs (Y_{j+1}, Y_j) of said first operand Y into a sequence of N signed digits Y_j said translator operating on positive 2's complement numbers, to translate for Y,

Y_{j+1}	Y_j	Y_{j-1}	Y_j
1	1	1	0
1	1	0	−1
1	0	1	−1

-continued

Y_{j+1}	Y_j	Y_{j-1}	Y_j
1	0	0	−2
0	1	1	+2
0	1	0	+1
0	0	1	+1
0	0	0	0;

a partial product generator having a first input connected to the output of said translator and its second input connected to receive said second operand X having 2M binary bits grouped into M pairs (X_{j+1}, X_j) expressed as the numerical value X_j of the respective pair, for multiplying said translated first operand times said second operand and outputting partial products consisting of signed digits, said partial product generator operating to multiply for

$$Y_j=+2;\ X_j\cdot Y_j=+X'_{j-1}$$

$$Y_j=-2;\ X_j\cdot Y_j=-X'_{j-1}$$

$$Y_j=+1;\ X_j\cdot Y_j=+X_j$$

$$Y_j=-1;\ X_j\cdot Y_j=-X_j$$

$$Y_j=0;\ X_j\cdot Y_j=0$$

to generate N×M partial products consisting of signed digits X_j times Y_j;

an array of adders, each adder having an input connected to two outputs from said partial product generator, for adding a first signed digit $A=X_j$ times Y_j of a first partial product, to a second signed digit $B=X_j$ times Y_j of a second partial product, providing a sum consisting of a sequence of signed digits, each adder operating on

INPUTS:

$-3\leqq A\leqq+3$

$-3\leqq B\leqq 3$

Carry In $=-1, 0, +1$

and generating

OUTPUTS:

Carry Out $=-4,\ 0, +4$ Independent of Carry In $-3\leqq C\leqq+3$

so that

For $+3\leqq A+B\leqq+6$, Carry out $=+4$

$-2\leqq A+B\leqq+2$, Carry Out $=0$

$-6\leqq A+B\leqq-3$, Carry Out $=-4$

the result is $A+B-(Carry\ Out)=-2, -1, 0, +1, +2$ $-3\leqq\{A+B-(Carry\ Out)+(Carry\ In)\}\leqq+3$ said sequence of signed digits output from said array of adders being the full product Z' expressed as a plurality of M+N−1 signed digits Z_f;

an inverse translator having an input connected to the output of said adders, for operating on said sequence of signed digits Z_f output from said adders, for providing a conventional binary expression Z OUT expressed as the value Z_j of pairs of adjacent binary numbers for the product of said first and second operands, said inverse translator operating

on an input $-2\leqq Z_f\leqq+3$ and eliminating negative values, by using $-1=-2+1$ to generate an output where Z_f is given by the Table

Z_f

1_fIN	+3	+2	+1	0	−1	−2	−3
1	2	1	0	3	2	1	0
0	3	2	1	0	3	2	1;

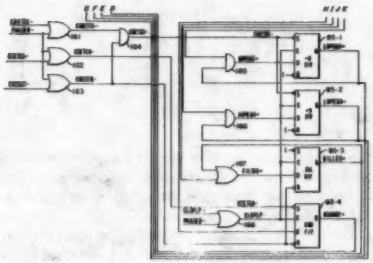
where the value 1_fIN is a binary "1" if there is a minus carry in and is a "0" if there is no minus carry in.

4,638,450

EQUAL NINE APPARATUS FOR SUPPORTING ABSOLUTE VALUE SUBTRACTS ON DECIMAL OPERANDS OF UNEQUAL LENGTH

Brian L. Stoffers, No. Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,751
Int. Cl.[4] G06F 7/38; G05F 7/50
U.S. Cl. 364—715 1 Claim



1. A digit equal nine apparatus for indicating if the difference from subtracting two operands is equal to the digit nine comprising:

A. a programmable read-only memory (PROM) having an address input including higher order and lower order bits, the higher order bits having one operand applied thereto and the lower order bits having a second operand applied thereto, said first and said second operands making up an address to read out the contents of a storage location in said PROM in which is stored a number that is equal to the difference between said two operands, and also stored in said addressed storage location is a digit equal nine bit that indicates if the number in the addressed PROM storage location has the value nine, said PROM having a first output on which a digit equal nine signal is placed responsive to said digit equal nine bit when said storage location is addressed using said two operands, said digit equal nine signal having a first state and a second state, said first state indicating that the result of the subtraction of said two operands is a digit other than the digit nine, said second state indicating that the result of the subtraction of said two operands is the digit nine,

B. an AND gate having a first data input for receiving said digit equal nine signal from said PROM output, a second input, and an output,

C. a flip-flop having a data input coupled to said AND gate output for receiving said digit equal nine signal, said flip-flop having a reset input for receiving a reset signal which places said flip-flop in a first state, said flip-flop also having a clocking input for receiving a clock signal which indicates that said PROM has subtracted said two operands applied to its address input, whereby said flip-flop will remain in said first state until the second state of said digit equal nine signal is on said first output from said PROM and in response thereto said flip-flop changes to its second state, and said flip-flop remains in said second state to indicate that the result of the subtraction performed by said PROM using said two operands is equal to the digit nine until said flip-flop is reset by said reset signal at the beginning of a subsequent subtraction operation, and said flip-flop also has an output on which is a first signal when said flip-flop is in its first state and on which is a second signal when said flip-flop is in its second state, said first signal providing an indication that the result of the subtraction by said PROM is other than the digit nine, said second signal providing an indication that the subtraction result is equal to the digit nine, and said flip-flop output also being applied to said second input of said AND gate, and

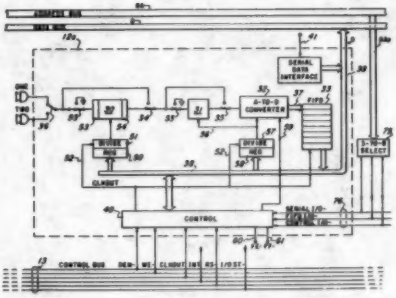
D. means for inhibiting the clocking of said flip-flop so that operands applied to the address input of said PROM can be subtracted without changing the state of said flip-flop.

4,638,451

MICROPROCESSOR SYSTEM WITH PROGRAMMABLE INTERFACE

Richard K. Hester, Whitewright, and Khen-Sang Tan, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1983, Ser. No. 491,140
Int. Cl.[4] G06F 3/05, 13/00
U.S. Cl. 364—900 7 Claims



1. A microcomputer system with programmable interface circuits comprising:

(a) processing means having a CPU, a memory, control bus means, and data bus means,

(b) an input interface circuit for said system coupled to said control bus means and to said data bus means; said input interface circuit including:

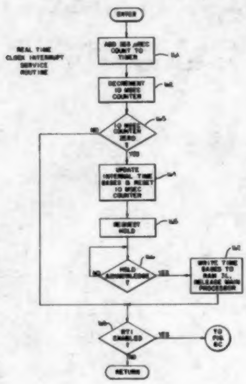
a data input, first translating means having an input connected to said data input and having an output, said first translating means performing a selectable translation of the form of data from said data input to produce translated data at said output, first memory means connected to receive said translated data from said output of said first translating means, said first memory means having an output coupled to said data bus means, and first control means receiving commands from said control bus means and receiving coded controls from said data bus means, said first control means selecting said translation of form used in said first translating means,

(c) an output interface circuit for said system coupled to said control bus means and to said data bus means, said output interface circuit including:

second memory means, said second memory means having an input connected to said data bus means and an output coupled to second translating means, said second translating means performing a selectable translation of the form of data from said output of the second memory means to produce translated data at an output, a data output coupled to said output of said second translating means, and second control means receiving commands from said control bus means and receiving coded controls from said data bus means, said second control

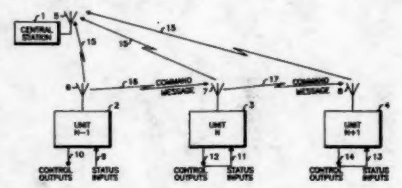
means selecting said translation of form used in said second translating means.

4,638,452
PROGRAMMABLE CONTROLLER WITH DYNAMICALLY ALTERED PROGRAMMABLE REAL TIME INTERRUPT INTERVAL
Ronald E. Schultz, Willoughby; Otomar Schmidt, Willoughby Hills, and David A. Johnston, Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.
Filed Feb. 27, 1984, Ser. No. 584,128
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—900 **3 Claims**



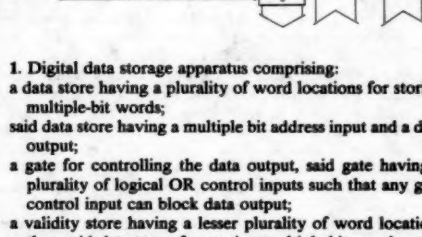
1. In a programmable controller which comprises:
- a memory for storing a user control program comprised of a set of control program instructions and for storing a user interrupt routine comprised of a second set of control program instructions;
- data table means for storing a real time interrupt interval number;
- main processor means coupled to the memory and the data table means for repeatedly executing the user control program to operate a machine connected to the programmable controller, said processor means including means for writing a real time interrupt interval number to the data table means when the processor means executes selected ones of the control program instructions;
- real time clock means coupled to the main processor means and the data table means, which interrupts the execution of the user control program at time intervals determined by the value of the stored real time interrupt interval number;
- wherein the main processor means executes the user interrupt routine each time the user control program is interrupted; and
- in which the real time clock means includes RTI in progress means for establishing the length of time required by the main processor means to execute the user interrupt routine after it is interrupted by the real time clock means, and comparison means for altering the length of time between real time interrupts from that indicated by the real time interrupt interval number when the length of time required by the main processor means to execute the user interrupt routine exceeds a preestablished portion of the interrupt interval indicated by the real time interrupt interval number.

4,638,453
SIGNAL PROCESSING UNIT
Paul Gran, Kfar Saba; Haim Feiner, Herzilia; Nissim Ben-Dayan, Tel-Aviv, all of Israel; Marian Stefaniu, Don Mills, Canada, and Yechiam Mar-Chaim, Tel Aviv, Israel, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 28, 1983, Ser. No. 479,537
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—900 **11 Claims**



1. A signal processing unit for use in a supervisory control system having at least one central station for communicating with a plurality of said units each identified by an unit address, said signal processing unit comprising:
- means for receiving messages including at least an address signal and an from said central station and/or said preceding unit;
- processing means for processing said information signal including means for modifying said address signal to provide a destination signal and preambling said destination signal to said processed information signal; and
- means for transmitting said processed information signal preambled by said destination signal to said central station and/or said succeeding unit.

4,638,454
DIGITAL DATA STORAGE APPARATUS
John R. Waterworth, Cheadle, England, assignor to Ferranti plc, Cheshire, England
Filed Dec. 3, 1982, Ser. No. 446,458
Claims priority, application United Kingdom, Dec. 4, 1981, 8136683
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **6 Claims**



1. Digital data storage apparatus comprising:
- a data store having a plurality of word locations for storing multiple-bit words;
- said data store having a multiple bit address input and a data output;
- a gate for controlling the data output, said gate having a plurality of logical OR control inputs such that any gate control input can block data output;
- a validity store having a lesser plurality of word locations than said data store for storing multiple-bit words, each individual bit in said validity store corresponding to one word location in said data store and capable of being set to

a particular state to indicate the corresponding word in said data store is invalid, and each word in said validity store corresponding to a sequence of several words in said data store based on the individual bits of said validity store word;

a plurality of auxiliary stores organized in an increasing order of significance defined as commencing with a first auxiliary store which is of lowest significance and of largest storage capacity, and ending with a smallest auxiliary store which is of highest significance;

said first auxiliary store having a number of bit locations at least equal to the number of word locations in said validity store, said first auxiliary store bit locations being organized as a plurality of first auxiliary store word locations for storing multiple-bit words, each of said number of first auxiliary store bit locations corresponding to a respective separate word in said validity store and capable of being set to a particular state to indicate invalidity of a sequence of words in said data store in turn corresponding to the corresponding separate word in said validity store, and each word in said first auxiliary store thus corresponding to a sequence of words in said data store based on the individual bits of each of the validity store words respectively corresponding to the bits of said first auxiliary store word;

each successively more significant auxiliary store having a lesser number of bit locations, the bit locations of each of the auxiliary stores of lesser significance than the smallest auxiliary store being organized as a plurality of word locations for storing multiple-bit words, and each auxiliary store bit location corresponding to a separate word in the next less significant auxiliary store and capable of being set to a particular state to indicate invalidity of a sequence of words in said data store corresponding to the corresponding word in each successively less significant auxiliary store of said plurality of auxiliary stores;

said validity store and each of said auxiliary stores having a respective address input connected to a number of the most significant address bits input to said data store sufficient to address a single bit in said validity store and each of said auxiliary stores; and

said validity store and each of said auxiliary stores having a validity data output applied as a control input to said gate such that if any bit addressed in said validity store or in said auxiliary stores indicates invalid data then data output from said data store is blocked;

whereby areas of said data store between selected limits can be declared invalid by setting bits in selected ones of said validity store and said auxiliary stores to the particular state.

4,638,455

FUNCTION DIAGNOSING SYSTEM

Etuo Yamazaki, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP83/00253, § 371 Date Apr. 4, 1984, § 102(e) Date Apr. 4, 1984, PCT Pub. No. WO84/00626, PCT Pub. Date Feb. 16, 1984

PCT Filed Aug. 4, 1983, Ser. No. 599,617

Claims priority, application Japan, Aug. 5, 1982, 57-136627

Int. Cl.⁴ G06F *11/22*

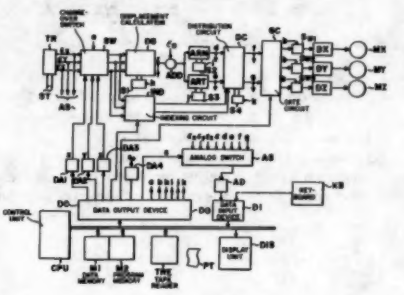
U.S. Cl. 364—900 2 Claims

1. An automatic regulation system for a machine controller that includes an input, an output and regulatable and testable functional units and produces output signals for controlling a machine, said system comprising:

control means, operatively connected to the machine controller and responsive to a prestored diagnostic instruction, for causing each functional unit of said machine controller to produce diagnostic output signals and producing regulation control signals for each functional unit for correcting the diagostic output signals; and

regulating means, operatively connected to said control means and the machine controller, for regulating and fixing the levels of the diagnostic output signals in dependence upon the regulation control signals to correct the diagnostic output signals, so that the machine controller produces the output signals at predetermined levels, and said control means comprising:

a control computer, operatively connected to the machine controller, for controlling the machine controller in dependence upon a command program having a diagnostic instruction, said control computer generating diagnostic input signals and input/output control signals and when the diagnostic instruction is executed, said control computer generating regulation control signals for the regulating means in dependence upon the diagnostic output signals to adjust the diagnostic output signals to predetermined levels, thereby adjusting the levels of the machine controller output control signals;



an input switch, operatively connected to said control computer, the machine and the input of the machine controller, for disconnecting the input to the machine controller from the machine and connecting the diagnostic input signals to the machine controller in dependence upon the input control signal;

an output switch, operatively connected to said control computer, the machine and the output of the machine controller, for disconnecting the output of the machine controller to the machine in dependence upon the output control signal; and

an analog switch, operatively connected to the machine controller and said control computer, for connecting the diagnostic output signals to said control computer.

4,638,456

SPOT QUANTITATION

John G. Elias, Wilmington, and Allan P. Jansson, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 27, 1984, Ser. No. 574,712

Int. Cl.⁴ G06F *15/20*; G06K *9/00*

U.S. Cl. 364—518 18 Claims

1. A method of quantitating spatially integrated intensities of individual spots contained in a multiple spot image defined by a discrete pixel-by-pixel representation of the intensities, which establishes a first sense, of the spots comprising the steps of:

(a) searching the image for the pixel representing the greatest intensity deviation in the first sense from a reference intensity level,

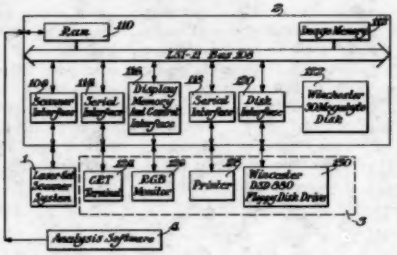
(b) constructing a mathematical three dimensional model of the spot containing such pixel, one of the dimensions being related to spot intensity,

(c) compensating the image by subtracting the mathematical model therefrom leaving possible overcompensated regions in the image which; regions together constitute a reduction volume,

(d) adjusting the dimensions of the model by the amount

necessary to give the model the same volume as the volume removed from the image in step (c) less the reduction volume,

(e) restoring all such overcompensated regions to the reference intensity level,



(f) quantitating the spot from the adjusted model by determining the volume of the adjusted model by multiplying the model's dimensions together and

(g) repeating steps (a) through (f) for successive pixels each having a lower intensity deviation from the reference level until the image is of substantially constant intensity.

4,638,457

METHOD AND APPARATUS FOR THE NON-VOLATILE STORAGE OF THE COUNT OF AN ELECTRONIC COUNTING CIRCUIT

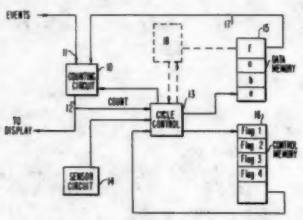
Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,196

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123444

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—189 **14 Claims**



1. Method for non-volatile storage of successive old and new counts in an electronic counting circuit in which said counts are stored by electronically reprogramming a non-volatile data memory in a reprogramming operation, which comprises: writing the respective new count data into first storage cells of said data memory prior to erasure of old count data in second storage cells of said first data memory, and during said reprogramming operation writing into storage cells of a non-volatile control memory control information which is indicating the actual state of said reprogramming operation and from which in case of interruption of said programming operation, the completion of said reprogramming operation is derived by logical arithmetic processing of said control information.

4,638,458

SEMICONDUCTOR MEMORY ADDRESS LINES WITH VARIED INTERVAL CONTACT HOLES

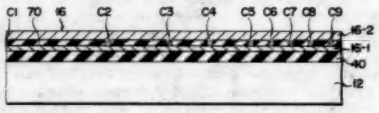
Yasuo Itoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1985, Ser. No. 715,360

Claims priority, application Japan, Mar. 30, 1984, 59-62730

Int. Cl.⁴ G11C *5/10*

U.S. Cl. 365—51 **5 Claims**



1. A semiconductor memory device comprising:

(a) a semiconductor substrate;

(b) a plurality of memory cells, which are formed on said semiconductor substrate, each having a memory cell transistor and a memory cell capacitor which is charged so as to reflect the logic state of its memory cell; and

(c) address lines which extend in row and column directions on said semiconductor substrate and select a particular memory cell for reading/writing data from/in the desired memory cell, said address lines including double layered address lines each of which comprises,

(i) first and second conductive lines of linear shapes each of which has a first end portion for receiving a voltage signal for selecting the particular memory cell and a second end portion at an opposite side of said first end portion, which are stacked, and which extend in one of the row and column directions, and

(ii) a linear insulative layer which extends along an extending direction of said first and second conductive lines, is sandwiched between said first and second conductive lines, has contact holes formed along the extending direction of said first and second conductive lines, and allows electrical connection between said first and second conductive lines through the contact holes, an interval of two neighbouring contact holes at the second end portion of each of said first and second conductive lines being set to be smaller than that of two neighbouring contact holes at the first end portion of each of said first and second conductive lines, thereby decreasing the maximum delay time in signal transfer at the second end portion of each of said double layered address lines, and the interval between two neighbouring contact holes at the first end portion of each of said first and second conductive lines is increased, thereby avoiding an increase in the total number of contact holes.

4,638,459

VIRTUAL GROUND READ ONLY MEMORY

Henry W. Pechar, Jr., Commack, and James D. Sproch, Rocky Point, both of N.Y., assignors to Standard Microsystems Corp., Hauppauge, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,591

Int. Cl.⁴ G11C *17/00*

U.S. Cl. 365—104 **10 Claims**

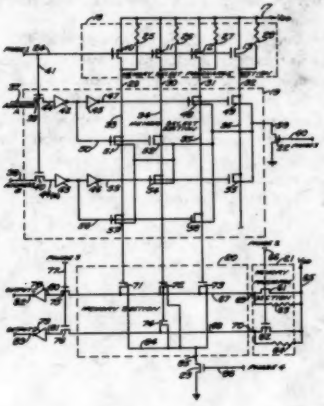
1. A read only memory comprising:

(a) a memory select section including input means and a plurality of memory select lines;

(b) virtual grounding means connected to a reference node for switched coupling said reference node in response to a first lock signal to a reference potential;

(c) switching means connected to said memory select lines for selectively coupling said memory select lines to said reference node in respose to a second clock signal applied to said input means, said virtual grounding means provid-

ing said reference node with said reference potential in one switching state thereof; and



(d) a memory section connected to said memory select section, said memory section being responsive to the electrical state of said memory select lines so as to produce an output determined thereby.

4,638,460

SEMICONDUCTOR MEMORY DEVICE

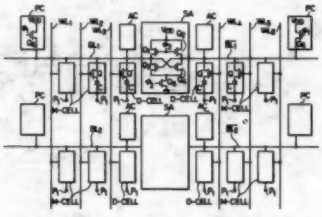
Tetsuro Matsumoto, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,079

Claims priority, application Japan, Sep. 22, 1982, 57-163888

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—149 **6 Claims**



1. A semiconductor memory device comprising:

a memory cell which includes a series connection comprised of a switching MISFET and a storage capacitor connected in series, said storage capacitor being comprised of a semiconductor region of a semiconductor substrate, a silicon nitride film formed over a surface of said semiconductor region, and a conductive layer formed over said silicon nitride film;

a bit line which is connected to one end of said series connection and which supplies a signal voltage having a predetermined maximum value to said memory cell; and

a terminal which is connected to the other end of said series connection and which supplies a voltage to said other end of said series connection so that a voltage of said storage capacitor to be stored between said semicoductor region and said conductive layer has a smaller absolute value than an absolute value of said maximum value of said signal voltage supplied to said bit line.

4,638,461

SEMICONDUCTOR MEMORY DEVICE

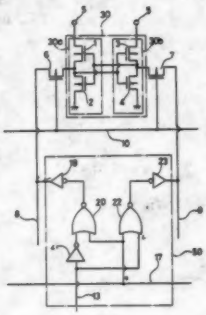
Ryo Yonezu, and Kazuhiro Sakashita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,678

Claims priority, application Japan, Aug. 17, 1983, 58-151263

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—189 **4 Claims**



3. A semiconductor device with the ability to write data into storage and read data out of storage, comprising:

memory cell, said memory cell having a plurality of input-/output lines, each of said input/output lines for inputting data into and outputting data from said memory cell;

a plurality of data bit lines for transmitting data to and from said memory cell, said plurality of data bit lines corresponding to said input/output lines in a one-to-one manner;

a plurality of transfer control means, one of said transfer control means connected between each of said data bit lines and said input/output lines, for controlling a flow of data between said bit lines and said input/output lines; and

writing circuit means, connected to each of said data bit lines and responsive to a write-in signal, for writing data onto selected ones of said bit lines from an external source when said write-in signal is indicative of a writing operation and charging all of said bit lines and placing the bit lines in a reading mode when said write-in signal is indicative of no writing operation.

4,638,462

SELF-TIMED PRECHARGE CIRCUIT

Thekkemadathil V. Rajeevakumar, Scarsdale, and Lewis M. Terman, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,624

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—203 **5 Claims**

1. A circuit for generating a precharge clock output signal in response to a memory array wordline signal resetting from a high to a low signal state comprising

a first reset signal and a second reset signal which is the complement of said first reset signal,

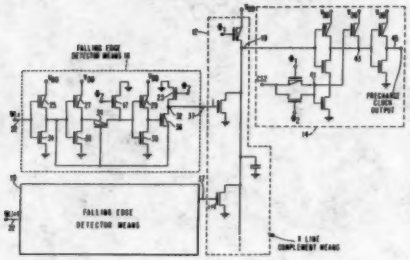
a plurality of identical falling edge detector means, each of said falling edge detector means connected to a separate memory array wordline, each of said falling edge detector means responsive to a signal change on an associated wordline from a high to a low signal state for producing an output signal which changes from a low to a high signal state in response to said wordline high to low signal change,

each of said falling edge detector means including first and second switching devices connected respectively between first and second nodes and a voltage supply equal to a low

signal state level, said first and second switching devices being turned off by said second reset signal, placing said first node at a high signal state and said second node at a low signal state when said wordline signal to said falling edge detector changes from said low to said high signal state, and

further including a falling edge detector output lead connected to said second node and wherein said signal thereon is said falling edge detector output signal,

an X-line complement inverter means connected to the outputs of all of said plurality of falling edge detector



means for producing an output signal which changes from a high signal state to a low signal state in response to a low to high output signal change from any of said plurality of falling edge detector means, and

a precharge generator means connected to the output of said X-line complement means for producing a precharge clock output signal only in response to said high to low signal state change from said X-line complement means, said precharge clock output signal, therefore, also being produced only in response to said high to low signal state change on a wordline.

4,638,463

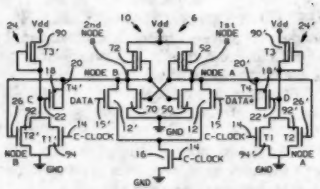
FAST WRITING CIRCUIT FOR A SOFT ERROR PROTECTED STORAGE CELL

Leonard R. Rockett, Jr., Washington, D.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,590

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—205 **4 Claims**



1. A fast writing circuit for a soft error protected storage cell, the protected storage cell having a first node and a second node which are respectively connected to a charging source, said storage cell being connected to a first binary state input device which is enabled by a write-enable input, said first node being selectively charged during a write interval when said write-enable input is on, to represent a stored, first binary logic state for said storage cell, the soft error protection circuit including an insulated gate, field effect capacitor having a diffusion electrode connected to said second node and having a gate electrode, for selectively loading said second mode with an additional capacitance when its gate is biased with respect to said diffusion electrode, said soft error protection circuit further including an inverter circuit having an input connected to said second node and an output for applying a capacitance enhancing bias to said gate electrode of said capacitor, for capacitively loading said second node, wherein the improvement comprises:

an insulated gate field effect transistor disabling device having its source connected to a reference potential, its drain connected to said gate of said capacitor and its gate connected to said write-enable input, for removing said bias on said gate of said capacitor in response to said write-enable input, thereby minimizing the capacitive load on said second node during said write interval;

whereby said soft error protected storage cell can be written into at a faster rate than has been previously possible.

4,638,464

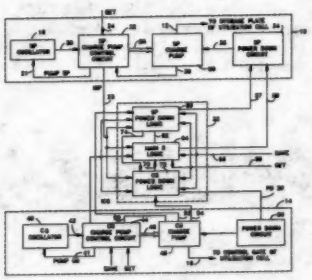
CHARGE PUMP SYSTEM FOR NON-VOLATILE RAM

Hayden C. Cranford, Jr., Apex, and Stacy J. Garvin, Durham, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,450

Int. Cl.[4] G11C *11/24*

U.S. Cl. 365—226 **7 Claims**



1. An on-chip voltage generating system for providing a plurality of different voltages to drive an integrated circuit (IC) chip comprising:

a first charge pump means having an output for supplying a plurality of different voltages;

a second charge pump means having an output for supplying a plurality of different voltages;

a first control means coupled to the first charge pump;

a second control means coupled to the second charge pump;

each of said first and second control means being responsive to an externally generated mode control signal and operable for sensing the voltage level at the output of its respective charge pump and for generating a first set of control signals for controlling said charge pump and a second set of control signals;

a first power down control means; and

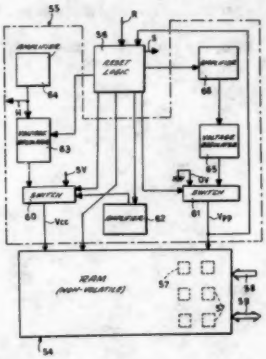
a second power down control means, each of said power down control means being responsive to the second set of control signals and operable to adjust the voltage level at the output of its respective charge pump.

4,638,465

INTEGRATED STRUCTURE MICROCOMPUTER PROVIDED WITH NON-VOLATILE RAM MEMORY

Paolo Rosini, Monza; Roberto Finaurini, Ancona, and Maurizio Galbotti, Barlassina, all of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Jan. 31, 1984, Ser. No. 575,686
Claims priority, application Italy, Aug. 4, 1983, 22415 A/83
Int. Cl.⁴ G11C *00/00*
U.S. Cl. 365—228 **7 Claims**



1. An integrated structure microcomputer, comprising:
a non-volatile RAM memory; and
voltage control circuitry joined to said memory, said circuitry being responsive to voltage changes on a supply line associated with said circuitry to alter a supply voltage applied by the circuitry to said memory, the memory including a matrix of non-volatile RAM cells responsive to changes in voltage supplied by the circuitry whereby data is stored in the cells, each of said cells comprising a bistable circuit with two interconnected branches, alternatively conducting and non-conducting, one of which includes a non-volatile memory element which can be electrically programmed in one or the other of two electric states as a function of the state in which said bistable circuit is at the moment of turn-off of power on said supply line and which also is able to cause the restoration of said state of the bistable circuit at the moment of power turn-on, each branch of said bistable circuit also including a control switch element controlled by the level of said power and by the state of the other branch of the bistable circuit whereby power turn-off allows the non-conducting branch of the bistable circuit to cause interdiction of the conducting branch of the same bistable circuit for consequent programming of said non-volatile memory element without current absorption.

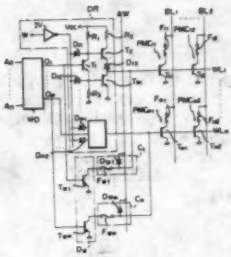
4,638,466

PROGRAMMABLE SEMICONDUCTOR MEMORY DEVICE HAVING SEPARATE READ WORD LINE DRIVERS AND WRITE-ONLY WORD LINE DRIVERS

Toshio Fukumoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 31, 1984, Ser. No. 687,353
Claims priority, application Japan, Dec. 29, 1983, 58-247702
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—230 **6 Claims**

1. A programmable semiconductor memory device comprising:
a plurality of word lines;
a plurality of bit lines intersecting said word lines;
programmable memory cells arranged on respective intersecting portions between said word lines and said bit lines;
a word line address decoder for selecting one of said word lines in response to an input address signal;
a read word line driver for absorbing a current from the selected word line during a read operation of said programmable memory cells, based on the output signal from said word line address decoder;



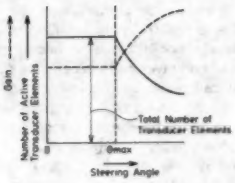
a write-only word line driver having a plurality of write-driving output transistors, each for absorbing a current from the selected word line during a write operation of said programmable memory cell, based on the output signal from said word line address decoder; and
a cutting means for cutting, after completion of write operation, the connection between said write-driving output transistors and said word lines.

4,638,467

AZIMUTH ADAPTIVE PHASED ARRAY SONAR

Yasuhito Takeuchi, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 617,083
Claims priority, application Japan, Aug. 31, 1983, 58-160105
Int. Cl.⁴ G01N *29/00*
U.S. Cl. 367—105 **2 Claims**



1. An azimuth adaptive phased array sonar comprising
a probe comprising an array of a plurality of transducer elements, said array having two ends;
a transmission and reception device for scanning in a sectorial pattern an ultrasonic beam transmitted and received by said probe in a phased array manner, wherein said transmission and reception device comprises
a receiver circuit comprising a delay line having a plurality of taps along the length thereof,
an amplifier circuit for receiving an output signal from said delay line, and
a cross point switch comprising a plurality of columns, a plurality of lines, and a plurality of switching elements arranged in a matrix at the intersections of said columns and said lines, said columns being connected to respective ones of said plurality of taps of said delay line, and said lines being connected to respective ones of said plurality of transducer elements; and

control means for selectively opening and closing said plurality of switching elements of said cross point switch;

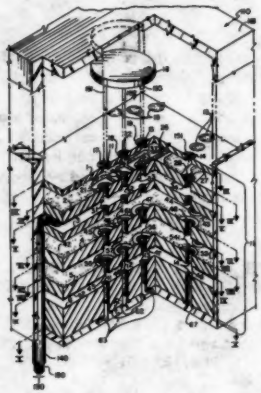
wherein said control means comprises means for directing said ultrasonic beam beyond the limit of azimuth angle of said ultrasonic beam such that signals generated from transducer elements remaining operative after an equal number of transducer elements from each end of said array are rendered inoperative, are switched through selected ones of said switching elements of said cross point switch and supplied over the entire length of said delay line.

4,638,468

POLYMER HYDROPHONE ARRAY WITH MULTILAYER PRINTED CIRCUIT WIRING

Samuel A. Francis, Marion, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 3, 1984, Ser. No. 637,664
Int. Cl.[4] H04R *1/00*
U.S. Cl. 367—153 **8 Claims**



1. A hydrophone array comprising:

a layer of piezoelectric polymer having a plurality of discrete first areas of electrically conductive film attached to one side of said layer and a second area of conductive film opposite said plurality of areas on the other side of said layer, each discrete area forming a hydrophone;

said plurality of discrete areas being arranged in a row;

a plurality of printed wiring layers in contact with each other and at least one side of said polymer layer;

one of said printed wiring layers having a plurality of parallel first output conductors parallel to said row and electrically isolated from each other;

a different one of said plurality of printed wiring layers having a plurality of second conductors, one under each area, transverse to said row;

a plurality of amplifying means, each having an input and an output;

a plurality of plated-through holes;

said holes making a plurality of selective electrical connections of one of said first area conductive films to the input of its associated said amplifier means, a plurality of selective electrical connections of one of said parallel first conductors to one of said plurality of second conductors connected to the output of said amplifying means, and selective electrical connections of said second area conductive film to a different one of said parallel first conductors;

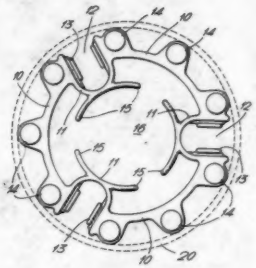
whereby said plated-through holes provide electrical connection between each of said hydrophones of the array and a respective one of said parallel first output conductors.

4,638,469

MECHANICAL SPACER FOR TOWED ACOUSTIC ARRAY

Michael J. Bryant; Frank R. Attenborough, both of Kent; Christopher G. Sykes, Medstead, and Neil W. Cameron, London, all of England, assignors to Britoil Public Limited Company, Glasgow, Scotland

Filed May 18, 1984, Ser. No. 611,976
Claims priority, application United Kingdom, May 18, 1983, 8313796
Int. Cl.[4] G01V *1/38*; H02G *7/12*
U.S. Cl. 367—154 **3 Claims**



1. A mechanical spacer for a towed acoustic array comprising a number of angularly spaced arcuate single strip sections joined together by intervening portions forming radially outwardly facing U-shaped recesses between the ends of adjacent strip sections, the parallel inner walls of each U-shaped recess being shaped to accept fastening means whereby a rope or like strain member can be secured in the base of the U-shaped recess, the arcuate strip sections each being provided with one or more radially outwardly resilient protrusions, each protrusion being in the shape of a hollow tube-like structure having a thin resilient wall section at its point furthermost from the center of the spacer.

4,638,470

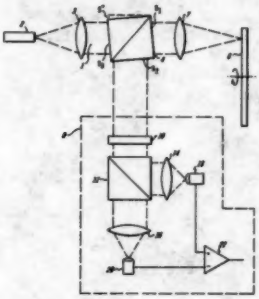
APPARATUS USING BEAM SPLITTER CUBE WITH SPECIFIC CHARACTERISTICS FOR READING INFORMATION RECORDED IN A MAGNETO-OPTIC MEDIUM

G. A. Neville Connell, Cupertino, and Jimmy D. Godwin, San Jose, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 9, 1984, Ser. No. 608,581
Int. Cl.[4] G11B *11/00*
U.S. Cl. 369—13 **1 Claim**

1. A system for providing a read signal from a magneto-optic storage medium having information encoded as directional magnetized domains, said system including first means for directing a focused, polarized light beam of a given wavelength λ_1 onto regions of the storage medium to provide an information beam having both s and p components due to the polar Kerr effect on the medium, and said system further including second means for measuring the phase direction of said s component of said information beam by referencing it to the phase direction of said p component of said information beam, said second means including a beam splitter cube, said beam splitter cube having the design characteristic of very high transmission of the p component of light of wavelength λ_2 and very high reflectance of the s component of light of wavelength λ_2, said wavelength λ_2 being different than said wavelength λ_1, said beam splitter cube being oriented such that

said information beam of wavelength λ_1 strikes one of its faces at normal incidence, due to said beam splitter cube being of design wavelength λ_2 said beam splitter cube operates in a leaky mode when the information beam of wavelength λ_1 is



incident thereon whereby said beam splitter cube directs a small portion of the p component of the information beam and a large portion of the s component of the information beam along a common path for utilization by other components of said second means.

4,638,471

OPTICAL SCANNING UNIT COMPRISING A TRANSLATIONAL-POSITION AND ANGULAR-POSITION DETECTION SYSTEM FOR AN ELECTRO-MAGNETICALLY SUSPENDED OBJECTIVE

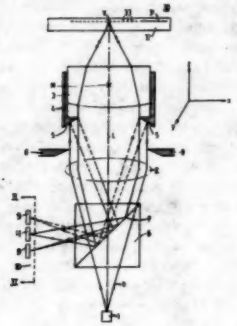
Gerard E. van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,102

Claims priority, application Netherlands, Jun. 10, 1985, 8501665

Int. Cl.[4] G11B *7/00, 21/10*

U.S. Cl. 369—46 **10 Claims**



1. An optical scanning unit comprising a radiation source, an objective lens for focussing a radiation beam produced by the radiation source to form a scanning spot on a surface to be scanned, a translational-position and angular-position detection system for detecting the translational positions of the objective lens along and the angular positions of said lens about two orthogonal axes which both extend perpendicularly to the chief ray of the radiation beam, and an actuating device for translating and tilting the objective lens in response to control signals supplied by the translational-position and angular-position detection system, characterized in that the translation-position and angular-position detection system comprises a conical-ring mirror which is centred and fixed relative to the objective lens and a radiation-sensitive detection system which is arranged in the path of the radiation reflected from the mirror and which comprises two detectors which are spaced by an annular strip and are each divided into four quadrants.

4,638,472

INFORMATION RECORDING SYSTEM AND METHOD FOR USING ALTERNATIVE RECORD AREA IN WRITING AND READING OF DATA ON OPTICAL DISK

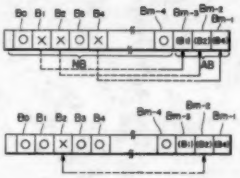
Mikito Ogata; Masahito Mori, both of Odawara; Takashi Doi, Hadano; Michio Miyazaki, and Takafumi Oka, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,961

Claims priority, application Japan, Mar. 11, 1983, 58-39213

Int. Cl.[4] G11B *20/12, 20/18*

U.S. Cl. 369—54 **8 Claims**



1. An information recording method for reading information after said information has been written onto a record medium, and if a record error area which does not meet a predetermined criterion is detected, rewriting alternative information for the information of said record error area into a different area on said record medium, characterized by

rewriting the information into said different area while the information of said record error area is kept valid.

4,638,473

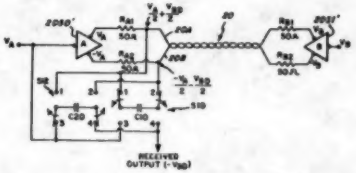
TWO WIRE BIDIRECTIONAL DIGITAL TRANSMISSION SYSTEM

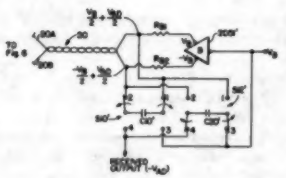
Michael Cooperman, Framingham, and Richard W. Sieber, Attleboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1984, Ser. No. 687,372

Int. Cl.[4] H04B *1/56*

U.S. Cl. 370—27 **5 Claims**





5. A twisted pair two wire bidirectional transmission system

for transmitting electrical signals simultaneously in opposite directions between first and second terminals connected at opposite ends to said twisted pair of two wires comprising:

a. a transmitter at the first terminal for generating a voltage signal VA onto a first one of said wires and the negative of said VA signal onto the second of said wires;

b. a transmitter at the second terminal for generating a voltage signal VB onto a first one of said wires and the negative of said VB signal onto the second of said wires;

c. capacitor means at said first terminal periodically coupled across said wires at the first terminal end and in series with said voltage signal VA to produce a delayed and attenuated version of the VB signal at the first terminal; and

d. capacitor means at said second terminal periodically coupled across said wires at the second terminal end and in series with said voltage signal VB to produce a delayed and attenuated version of the VA signal at the second terminal.

4,638,474

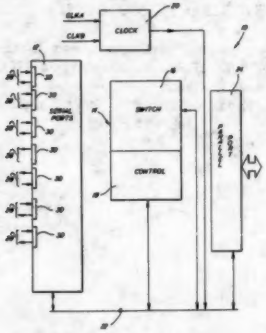
COMMUNICATION SYSTEM

Alain R. G. Chalet, Overijse, Belgium, assignor to ITT Corporation, New York, N.Y.

Filed Dec. 14, 1984, Ser. No. 682,038

Int. Cl.[4] H04Q *11/04*; H04J *3/24*

U.S. Cl. 370—60 **6 Claims**



1. An apparatus for establishing communications paths comprising:

a digital switching network having at least one terminal element interconnected therewith for providing access thereto;

means for interfacing a plurality of subscribers with said switching network, said interfacing means including a first apparatus for establishing communication paths and a second apparatus for establishing communication paths, said first apparatus being adapted to interface said plurality of subscribers to said switching network via said terminal element and said second apparatus being adapted to interface said same plurality of subscribers directly to said switching network.

4,638,475

ROUTER UNIT AND ROUTING NETWORK FOR DETERMINING AN OUTPUT PORT BY DETECTING A PART OF AN INPUT PACKET

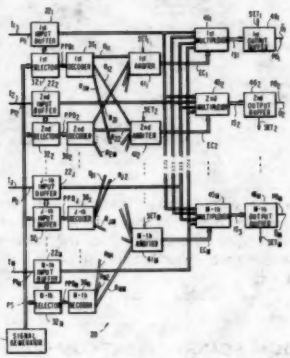
Nobuhiko Koike, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,264

Claims priority, application Japan, Jun. 21, 1982, 57-106453; Jun. 21, 1982, 57-106454

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **6 Claims**



1. A router unit for use in a routing network to respond to a plurality of input packets supplied through a plurality of input ports, respectively, and to distribute said input packets to at least one of a plurality of output ports as output packets, each of said input packets including destination bit series representative of a destination and being divisible into a plurality of partial bit series placed at bit series positions, respectively, said router unit comprising:

first means for producing a position signal indicative of a predetermined one of said bit series positions that is preassigned to said router unit as a function of the position of said router unit in said routing network;

a plurality of second means coupled to respective input ports and said first means for selecting predetermined ones of the bit positions from the respective input packets in response to said position signal to derive predetermined ones of said partial bit series corresponding to said predetermined bit positions from said destination bit series; and

third means coupled to the respective second means and the respective output ports and responsive to the respective input packets for selecting said at least one output port with reference to said predetermiend ones of the partial bit series selected by said second means so as to deliver each of said input packets as said output packets to said at least one output port selected by said third means.

4,638,476

TECHNIQUE FOR DYNAMIC RESOURCE ALLOCATION IN A COMMUNICATION SYSTEM

Anthony Acampora, Freehold, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 21, 1985, Ser. No. 747,430

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—83 **10 Claims**

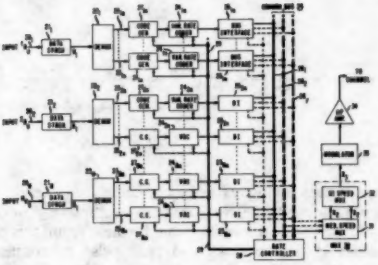
1. A transmitter for a communication system comprising:

a plurality of coding means, each encoding means being disposed to receive a separate input signal and for encoding the input signal into an encoded output signal using a predetermined one of a plurality of codes with different

redundancies at any instant of time in response to a separate control signal;

a common bus comprising one or more buses;

a plurality of bus interface (BI) units, each BI unit being disposed to receive the encoded output signal from a separate one of the plurality of encoding means and for assembling the received encoded signal into packers of information for insertion in a next free time slot on a bus of the common bus associated with the BI unit; and



control means responsive to data propagating within the transmitter for generating control signals to predetermined ones of the plurality of encoding means for changing the codes used and the data rate of the encoded output signal to maintain the data propagating on each bus at a predetermined maximum threshold level while providing a predetermined amount of margin for overcoming fading or interference at a remote receiver.

4,638,477

PACKET EXCHANGE DATA TRANSMISSION SYSTEM

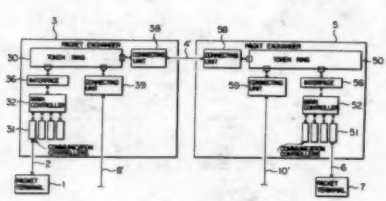
Jun Okada; Koichi Kunimasa, both of Hadano, and Hiroshi Nakase, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,593

Claims priority, application Japan, Dec. 26, 1983, 58-243885

Int. Cl.[4] H04J 3/26

U.S. Cl. 370—94 **2 Claims**



1. A packet exchange data transmission system having at least two packet exchangers, each of said packet exchangers having a packet terminal and an external transmission line connected thereto, sending a data packet supplied from said packet terminal to said external transmission line through an internal transmission line, supplying the data packet sent from said external transmission line to said packet terminal through said internal transmission line and being connected to another packet exchanger through said external transmission line, said packet exchangers each comprising:

first means for checking a validity of the data packet sent from said packet terminal and sending the data packet to said internal transmission path, and reading in the data packet on said internal transmission line, checking a validity of the data packet and sending the data packet to said packet terminal, and

second means including a memory for storing the data packet on said internal transmission line into said memory, reading out the data packet from said memory and sending the data packet to said external transmission line, and storing the data packet transmitted from said external transmission line in said memory, reading the data packet from said memory and sending the data packet to said internal transmission line,

wherein said internal transmission line is a token ring constructed to send a transmission right token to each of said first and second means for acquiring a transmission right, said first means sends the data packet sent from said packet terminal to said token ring, receiving the data packet from said token ring and sending the data packet to said packet terminal, and said second means stores the data packet of said token ring into said memory, reads out the data packet from said memory and sends the data packet to said external transmission line, stores the data packet sent from said external transmission line into said memory, reads out the data packet from said memory and sends the data packet to said token ring.

4,638,478

FRAME SYNCHRONIZING SYSTEM IN A RECEIVER IN A TIME-DIVISION MULTIPLEX TRANSMISSION SYSTEM

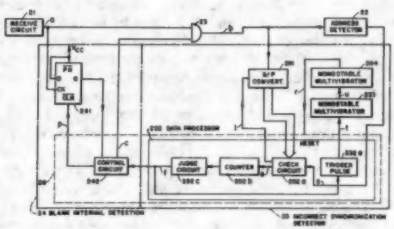
Michinori Hatabe, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan

Filed Jun. 21, 1985, Ser. No. 747,722

Claims priority, application Japan, Jun. 21, 1984, 59-126327

Int. Cl.[4] H04J 3/26

U.S. Cl. 370—94 **11 Claims**



1. In a frame synchronizing system is a receiver receiving a time-division multiplex signal having a plurality of channels corresponding to a plurality of receivers, each channel signal comprising a start signal part corresponding to a start bit, an address signal part representing an address assigned to a corresponding receiver, an error detecting code signal part, an information signal part representing information to be transmitted to a corresponding receiver, and a blank interval, said frame synchronizating system comprising an address detecting means detecting the address signal part of the channel signal correspon to the receiver in the multiplex signal to generate a channel detection signal, the improvement which comprises means detecting said blank interval in the time-division multiplex signal received at the receiver, said blank interval detecting means generating a blank interval detection signal at a time when said blank interval is detected, said blank interval detection signal being maintained after first detection of said blank interval, gate means for blocking transmission of the multiplex signal to said address detecting circuit but permitting the multiplex signal to be transmitted to said address detecting circuit in response to said blank interval detection signal from said blank interval detecting means, and incorrect synchronization detecting means for detecting incorrect synchronization due to production of said error detecting code signal after reception

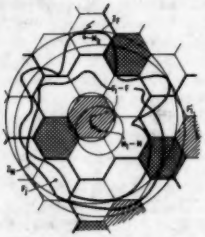
of said channel detection signal from said address detecting means, said incorrect synchronization detecting means generating an incorrect synchronization signal to reset said blank interval detecting means to an initial condition.

4,638,479

METHOD OF TWO-WAY RADIOCOMMUNICATION BETWEEN FIXED STATIONS AND MOBILE STATIONS

Roger P. J. Alexis, Neuilly sur Seine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1984, Ser. No. 678,617
Claims priority, application France, Dec. 9, 1983, 83 19749
Int. Cl.[4] H04J *3/16*; H04Q *7/00*; H04B *1/00*
U.S. Cl. 370—95 15 Claims



1. A method for selecting channels for two-way radiocommunication between fixed stations and mobile stations using a set of communication channels wherein a first group of said channels forms a "down" path that is reserved for transmission from all the fixed stations and a second group of said channels forms an "up" path that is reserved for transmission from all the mobile stations, and at least one semaphore channel, each pair of communication channels formed by one of the communication channels of the "up" path and one of the communication channels of the "down" path being capable of handling two-way communication between any of the fixed stations and any of the mobile stations comprising the steps of: each fixed station detecting the channels in the "up" path occupied by communications from mobile stations for which the power level received from the said mobile stations exceeds a first predetermined threshold; each fixed station storing the addresses of the detected channels; each fixed station continuously transmitting via the semaphore channel assigned to said fixed station the addresses stored by the fixed station, and in which, in order to establish communication with a fixed station the further steps of: a mobile station detecting the channels in the "down" path occupied by communications from fixed stations for which the power level received from the said fixed stations exceeds a second predetermined threshold; said mobile station storing the addresses of the detected channels and selecting a pair of free communication channels whose addresses are different from the addresses of the busy channels detected by the said mobile station and from the addresses of busy channels transmitted via the semaphore channel allocated to the selected fixed station.

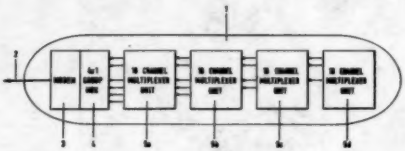
4,638,480

DISTRIBUTED DIGITAL SIGNAL MULTIPLEXING

Kenneth S. Darton, Bishops Stortford, England, assignor to Standard Telephones & Cables Public Limited Company, London, England

Filed Apr. 10, 1985, Ser. No. 721,770
Int. Cl.[4] H04J *3/04*, *3/00*
U.S. Cl. 370—112 6 Claims

1. An arrangement for digital multiplexing onto a common highway a plurality of analogue input signals, the arrangement including a series of m time division multiplexing units, each multiplexing unit having for each of n separate analogue input signals a signal channel comprising an analogue-to-digital encoding means, a shift register in which said encoding means output may be temporarily stored, and means for periodically reading out the contents of the shift register to an outlet common to all the n channels, clock and timing means and synchronising means for controlling the encoding and said shift register, in each of the n channels whereby the digitally encoded signals in the n shift register are read out to said outlet in a predetermined multiplexed sequence, outlets from the m time division multiplexing units being fed to a common multiplexer where the m outlets of n channels each are multiplexed onto



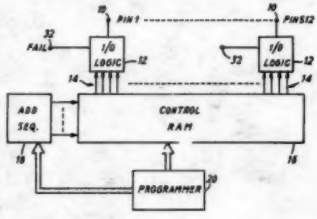
said common highway, the clock, said timing and synchronising means in the m time division multiplexing units being cascaded, the multiplexing unit furthest from the common multiplexer having clock and sync pulse generating means generating initial clock and synchronisiong pulses for the n channels, each subsequent multiplexing unit nearer the common multiplexer and the common multiplexer itself having means for regenerating clock and sync pulses received from the preceding multiplexing unit and means for deriving from the regenerated pulses the local clock and sync pulses required in the multiplexing unit or common multiplexer.

4,638,481

METHOD AND APPARATUS FOR GENERATING SEQUENCE OF MULTIBIT WORDS

Michael P. Crane, and David J. Marsh, both of Poole, England, assignors to Membrain Limited, Wimborne, England

Filed Oct. 26, 1984, Ser. No. 665,240
Claims priority, application United Kingdom, Oct. 28, 1983, 8328880
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 9 Claims



1. A machine method of generating a sequence of m-bit multibit words selected from a set N of the words, wherein m is an integer, N is a substantially larger integer not exceeding 2^m and the words are formed in succession in a plurality m of bistable devices, the method comprising the steps of:

(a) storing a set n of change words each of which consists of a corresponding selection of change commands, where n is a plural integer substantially smaller than n,

(b) addressing a sequence of the stored change words where said sequence is larger than n and at least some of said change words appear repeatedly in said sequence, and

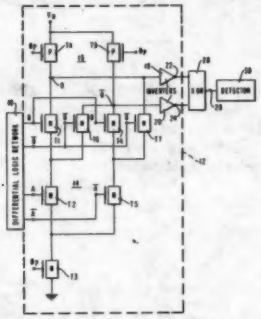
(c) applying each addressed change word to effect changes of state of selected ones of the bistable devices in accordance with the change commands included in such change word.

4,638,482

RANDOM LOGIC ERROR DETECTING SYSTEM FOR DIFFERENTIAL LOGIC NETWORKS

William R. Griffin, Shelburne, Vt.; Lawrence G. Heller, Boca Raton, Fla., and Peter N. Horowitz, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,880
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—63 12 Claims



1. A system comprising

a differential logic network having a plurality of complementary pairs of output terminals,

a differential exclusive OR circuit having inputs for receiving signals from the output terminals of said logic network and first and second output terminals,

a second exclusive OR circuit having first and second input terminals coupled to the first and second output terminals of said differential exclusive OR circuit and having a single output terminal with first and second output states, and

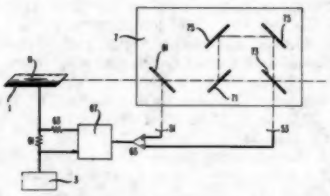
means connected to said single output terminal for detecting said output states.

4,638,483

HIGH SPEED INTENSITY MODULATED LIGHT SOURCE

John E. Bowers, East Brunswick, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 30, 1984, Ser. No. 635,754
Int. Cl.[4] H01S 3/10
U.S. Cl. 372—26 9 Claims



1. A direct intensity modulated light source comprising a single frequency laser;

means for frequency modulating said laser to yield a frequency modulated output beam; and

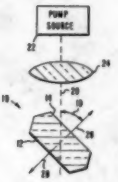
means for delaying a first portion of said output beam with respect to a second portion of said output beam and recombining said portions to produce intensity modulation.

4,638,484

SOLID STATE LASER EMPLOYING DIAMOND HAVING COLOR CENTERS AS A LASER ACTIVE MATERIAL

Stephen C. Rand, Agoura, and Larry G. DeShazer, Palos Verdes Estates, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,304
Int. Cl.[4] H01S 3/16
U.S. Cl. 372—42 20 Claims



1. A laser comprising:

resonant cavity means for supporting coherent radiation;

a diamond containing color centers as a laser active material;

means for exciting the color centers to emit coherent radiation; and

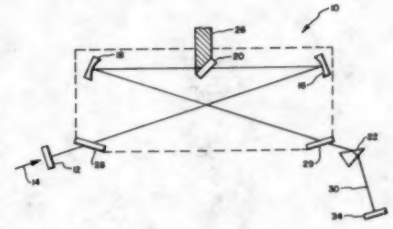
optical path means for providing an exit path for the radiation from the resonant cavity means.

4,638,485

SOLID STATE VIBRATIONAL LASERS USING F-CENTER/MOLECULAR-DEFECT PAIRS IN ALKALI HALIDES

Werner Gellermann; Yihong Yang, and Fritz Luty, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 591,465, Mar. 20, 1984. This application Oct. 3, 1985, Ser. No. 783,978
Int. Cl.[4] H01S 3/16
U.S. Cl. 372—42 9 Claims



1. A laser having a laser action in the infrared wavelength region comprising:

an alkali halide crystal having dilute diatomic molecular defects;

F-center defects in said alkali halide crystal associated with said molecular defects;

cooling means for cooling said crystal below about 77K;

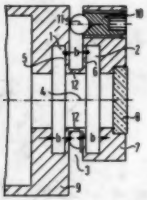
optical pumping means for pumping the F-center/molecular defect pairs in the visible wavelength range.

4,638,486

ADJUSTMENT DEVICE FOR A REFLECTOR MIRROR OF A LASER RESONATOR

Willibald Dost, and Hans Kreutzer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,106
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1984, 3423381
Int. Cl.[4] H01S 3/08
U.S. Cl. 372—107 5 Claims



1. In a laser resonator of the type which includes a reflector mirror mounted in an adjustment head carrier and spaced from the carrier by an outer peripheral recess therebetween and in which the carrier and the adjustment head comprise a light passageway therethrough having an axis, and in which adjustment elements are carried by the adjustment head and engage the carrier, the improvement therein comprising:

first means defining a first radially extending circular recess about the light passage in the carrier and a first thin discoid wall separating said first recess from the outer peripheral recess; and

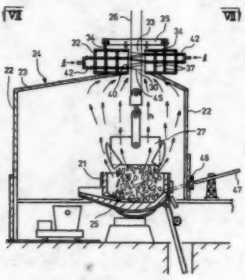
second means defining a second circular recess about the light passageway in the adjustment head and a second thin discoid wall separating said second recess from the outer peripheral recess.

4,638,487

SHROUD FOR ARC FURNACE

Fumio Tomizawa, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 696,087
Claims priority, application Japan, Aug. 30, 1984, 59-131849[U]
Int. Cl.[4] F27D 23/00
U.S. Cl. 373—9 3 Claims



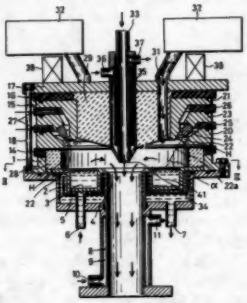
1. A shroud for a steel making arc furnace having dust-proof side walls and a duct-proof top wall, said walls surrounding an arc furnace main body, and also having doors for movement of a suspended scrap bucket into and out of said shroud, said top wall having an opening of a minimum width, sufficiently wide for a bucket suspension device to move transversely to a center of said arc furnace main body, a suction duct disposed at said top wall at said opening, said suction duct having a top, passage at said top of said suction duct and through which said bucket suspension device is movable laterally, and a plurality of suction ports opposed to each other horizontally across said opening, a plurality of injection pipes in said suction ports disposed such that injection pipes in one of the suction ports are staggered vertically in zig-zag manner with respect to injection pipes in the other suction port, said injection pipes having a plurality of nozzles for spraying fluid horizontally toward an opposed suction port, and a top door for selectively opening and closing said passage.

4,638,488

FINE GRAINS PRODUCING APPARATUS

Yasunobu Shimomoto, Nagoya, Japan, assignor to Daidotokushuko Kabushikikaisha, Nagoya, Japan

Filed Aug. 20, 1985, Ser. No. 767,245
Claims priority, application Japan, Jun. 20, 1985, 60-135075
Int. Cl.[4] H05H 1/00
U.S. Cl. 373—22 4 Claims



1. A fine-grain-produced apparatus comprising a furnace, a toroidal melting pot provided in the lower portion of said furnace for containing a toroidal pile of raw material for fine grains, a ring plasma torch mounted over said pile of raw material for generating a plasma arc rotating azimuthally between said plasma torch and the surface of said pile of raw material, and a discharge port centrally provided around the major axis of said toroidal melting pot and communicating with the same for collecting fine grains produced from said pile of raw material together with neutral gas for plasma medium.

4,638,489

METHOD AND MEANS FOR USE IN THE INSTALLATION OF PLASMA GENERATORS IN SHAFT FURNACES

Jan Thörnblom, and Gunnar Astner, both of Hofors, Sweden, assignors to SKF Steel Engineering AB, Hofors, Sweden

Filed Mar. 28, 1985, Ser. No. 717,312
Claims priority, application Sweden, Oct. 19, 1984, 8405229
Int. Cl.[4] H05H 1/26
U.S. Cl. 373—24 15 Claims

7. A plasma melting furnace arrangement comprising:

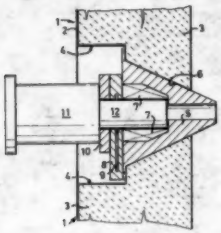
(A) a refractory lined furnace wall having an opening therein for receiving a plasma generator and, fixably mounted in said opening:

(1) a field coil arranged to cooperate with an electrode of said plasma generator to effect rotation of an electric arc and

(2) a sealing means arranged to effect a gas type seal with said plasma generator; and

(B) a plasma generator removably mounted in said opening of said refractory lined furnace wall and having electrodes

for generating an electric arc therebetween, said plasma generator comprising a nose portion which is extendible



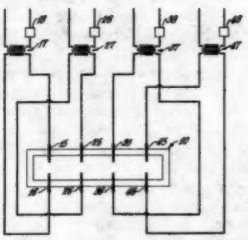
through said sealing means and into said field coil, one of said electrodes being provided in said nose portion.

4,638,490

MELTING FURNACES

Charles S. Dunn, Pataskala; Mark A. Propster, and Charles M. Hohman, both of Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 5, 1984, Ser. No. 658,018
Int. Cl.[4] C03B 5/027
U.S. Cl. 373—35 **4 Claims**



1. An electrically heated melter for forming molten material from particulate batch and discharging at its bottom the molten material directly into a product forming region comprising:

a chamber formed of heat resistant material for holding molten material, the chamber having at least one outlet at its bottom in communication with a product forming region;

each product forming region including a forming means disposed to receive molten material directly discharged from an outlet in the bottom of the chamber;

a first group of spaced apart electrodes located within the chamber;

a second group of spaced apart electrodes located within the chamber;

the electrodes in the first and second groups being arranged in pairs of opposed electrodes in spaced apart relationship wherein each pair of electrodes includes one electrode from the first group and one electrode from the second group; and

independent means for controllably supplying electrical current separately to each pair of opposed electrodes to allow the temperature of the molten glass entering the outlets to be adjusted to provide molten material to the outlets with a heat pattern which will optimize forming performance,

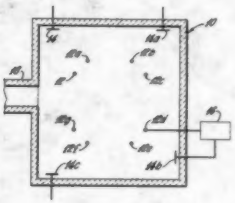
said melter creating an essentially isothermal condition across a given horizontal plane of the body of molten material.

4,638,491

METHOD FOR PROTECTING THE HEATING ELECTRODES OF GLASS MELTING FURNACES

Richard A. Perkins, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 14, 1981, Ser. No. 263,440
Int. Cl.[4] C03B 5/027
U.S. Cl. 373—39 **1 Claim**



1. A method of operating an electric melting furnace containing a body of molten material and having heating electrodes immersed in the molten material comprising the steps of:

(a) applying a source of alternating current to the heating electrodes;

(b) immersing at least one counter electrode in the molten material;

(c) applying a source of direct current between the counter electrodes and heating electrodes;

(d) establishing a corrosion current density for the heating electrodes measured in units of amperes per square centimeter of electrode surface; and

(e) establishing a concentration polarization limit for the counter electrode measured in units of amperes per square centimeter of electrode surface; and

(f) maintaining a current density at the heating electrodes that is slightly above the corrosion current density of step (d) and maintaining a current density at the counter electrodes that is well below the concentration polarization limit of step (e) wherein the heating electrodes have a large surface area in comparison to the surface area of the counter electrodes and wherein the counter electrodes have a small surface area in comparison to the surface area of the heating electrodes.

4,638,492

ROOF ASSEMBLY FOR AN ELECTRIC ARC FURNACE

Robert L. Kerr, Poland, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 818,441
Int. Cl.[4] F27D 1/02
U.S. Cl. 373—74 **6 Claims**

1. A fluid cooled roof assembly for an electric arc furnace where electrodes are inserted in the interior of the furnace, which furnace has sidewalls for holding metal scrap and which roof assembly has conduits for bringing to and carrying away coolant from said roof assembly, comprising:

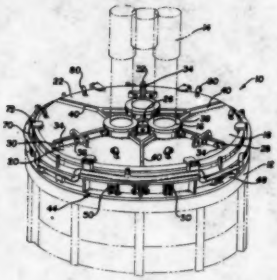
outer ring means defining the outer periphery of said roof and constructed and arranged in a manner to rest on said sidewalls of said furnace and to extend upwardly away from said sidewalls giving added height to said furnace, and

a number of circular panel sectors connected together to form a main roof section for said roof assembly and associated to said outer ring means and secured to each other in a manner such that said roof assembly is in a relatively flat disposition covering the top of said furnace,

said each panel sector being in a triangular shape and having opposed outer longitudinal edges along which an indented area is formed upon which when said panel sectors are assembled said indented area cooperates with an indented

area of an adjacent panel sector to form an opening for said insertion of one of said electrodes,

said each panel sector further having an area along its said opposed longitudinal edges inwardly of said indented area



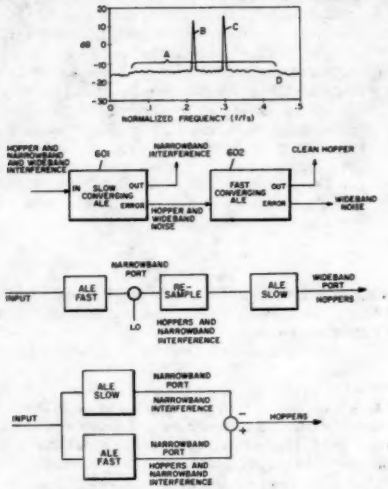
which upon said connection of said panel sectors mate with that of its said adjacent sector to form a central juncture and a central electrode area encompassing said formed electrode openings.

4,638,493

ADAPTIVE INTERFERENCE REJECTION FOR IMPROVED FREQUENCY HOP DETECTION

F. Avery Bishop, and Ronald S. Leahy, both of Salt Lake City, Utah, assignors to Sperry Corporation, Blue Bell, Pa.

Filed Jun. 17, 1985, Ser. No. 745,487
Int. Cl.[4] H04B *15/00*; H04L *27/30*
U.S. Cl. 375—1 **13 Claims**



1. A time-bandwidth discrimination system for providing enhanced frequency hop detection comprising,

a first adaptive line enhancer (ALE) with a relatively slow convergence factor, and

a second adaptive line enhancer (ALE) with a relatively fast convergence factor connected to said first adaptive line enhancer thereby to separate, isolate and distinguish frequency hop signals from interference signals,

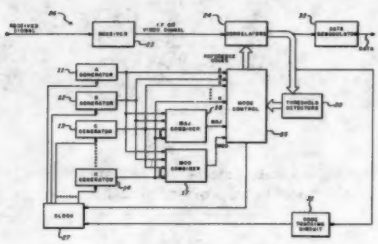
each of said first and second ALEs having an input terminal, a signal output terminal, and an error output terminal wherein, the respective convergence factor is defined by an iterative algorithm by which the signal at the error output terminal is "converged" toward a minimum value.

4,638,494

SYSTEM FOR THE ACQUISITION OF CODE SIGNALS

Earl M. Kartchner, Salt Lake City, Utah; Robert Price, Lexington, Mass., and Gary R. Van Horn, Salt Lake City, Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,040
Int. Cl.[4] H04K *1/08*
U.S. Cl. 375—2.2 **23 Claims**



16. A data communication system comprising:

a data transmitting system including component code generation means for providing acquisition component code signals, composite code generation means responsive to said acquisition component code signals for providing an acquisition composite code signal composed therefrom in accordance with a first composition rule whereby at least one of said acquisition component codes correlates with said acquisition composite code and a transmitter means for transmitting said acquisition composite code signal; and

a data receiving system including reference component code generation means for providing reference component codes that correlate with said acquisition component codes respectively, acquisition means responsive to said reference component codes and said transmitted signal for acquiring said transmitted signal with respect to each of said reference component codes thereby acquiring said transmitted signal in accordance with said acquisition composite code, verification code generation means responsive to said reference component codes for providing a verification composite code signal composed therefrom in accordance with a second composition rule of such a character that said verification composite code correlates with said acquisition composite code only when all of said reference component codes are aligned to correlate respectively with the corresponding acquisition component codes in said acquisition composite code, and correlator means responsive to said verification composite code signal and said acquired transmitted signal for obtaining the cross-correlation therebetween, thereby providing a verification signal representative of the successful acquisition of said transmitted acquisition composite code signal.

4,638,495

AUTOMATIC ADAPTIVE EQUALIZER

Shoichi Mizoguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 601,885
Claims priority, application Japan, Apr. 19, 1983, 58-68635
Int. Cl.[4] H03H *7/30*; H03K *5/159*
U.S. Cl. 375—14 **4 Claims**

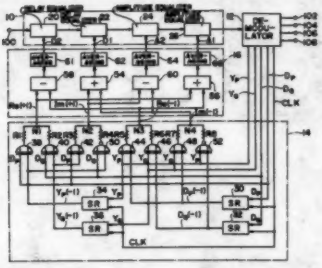
1. An automatic adaptive equalizer for use in a digital radio transmission system, comprising:

a first means for equalizing at least one of amplitude and delay distortions of an incoming IF signal;

a demodulator being supplied with the output of said first means, and generating a plurality of data signals and a plurality of error signals;

a control signal generator receiving said plurality of data

signals and said plurality of error signals, and generating a plurality of in-phase control signals and a plurality of quadrature control signals; and



a second means coupled to the output of said control signal generator, said second means performing additions and subtractions of said in-phase and quadrature control signals, and for applying the results of said addition and subtractions to said first means.

4,638,496

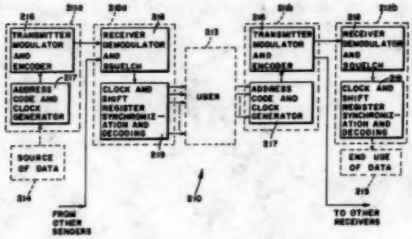
SECURE RELIABLE TRANSMITTING AND RECEIVING SYSTEM FOR TRANSFER OF DIGITAL DATA

Garold K. Jensen, 1024 Falcon Dr., River Falls, Wis. 54022

Division of Ser. No. 347,952, Feb. 11, 1982, Pat. No. 4,536,747. This application Apr. 15, 1985, Ser. No. 723,316

Int. Cl.[4] H04B *1/10*

U.S. Cl. 375—104 **4 Claims**



3. A secure reliable transmitting and receiving system for the transfer of digital data, comprising:

means for encoding a block of information, said block of information having a predetermined number of clock cycles, a predetermined number of bits of digital data, and a predetermined unmodulated time gap all repeated a preselected number of times, said block of information having a waveform distinct from that of noise and interference;

means for generating a radio frequency carrier;

means connected with said radio frequency carrier means for modulation of said radio frequency carrier with said block of information;

receiving means for receiving and demodulating said block of information;

circuit means associated with said receiving means for transmitting said block of information and rejecting noise and interference, said circuit means including:

(i) first low pass filter and high and low level schmitt trigger circuitry for providing a first stage of discrimination between said block of information and noise and interference in random bursts or in continuous form;

(ii) gating circuitry associated with said filter and trigger circuitry for transmitting the block of information immediately following said block of information to additional signal processing circuitry and for blocking transmission of noise and interference;

(iii) second low pass filter and one shot trigger circuitry for providing a second stage of discrimination between said immediately following block of information and noise and interference and for providing an output decoder reset pulse when the signal received by said second low pass filter and one shot trigger circuitry is said immediately following block of information and for providing no output decoder reset pulse when noise or interference is received by said filter and one-shot trigger circuitry;

(iv) divider, gating, phase locked loop clock generator, shift register and decoding circuitry for providing a third stage of discrimination between transmitted said immediately following block of information and noise and interference, said third stage of discrimination beginning only on receipt of said output decoder reset pulse signaling receipt by said second state of discrimination of said immediately following block of information rather than receipt of noise or interference, receipt of both said output decoder reset pulse and said immediately following block of information initiating count of said clock cycles and count of said digital data bits where start and termination times of said counts determine precise time periods when said clock cycles may be admitted to the phase lock loop for synchronization of said phase lock loop and the shift register and when said digital data bits may be entered into shift register, loading of said shift register terminates said counts thereby initiating off-loading of said digital data bits in said shift register in parallel to said decoding circuitry, clearing said shift register of all said digital data bits, outputting a readout enable pulse, and locking up all circuit operations of the divider, gating, phase locked loop clock generator, shift register, and decoding circuitry pending reactivation by receipt of additional said output decoder reset pulses.

4,638,497

FRAMING CODE DETECTOR FOR A TELETEXT RECEIVER

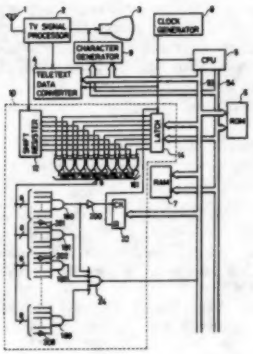
Shigeru Komatsu, Yokohama, and Keiji Kawata, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Video Engineering, Ltd., Kanagawa, both of, Japan

Filed Sep. 24, 1984, Ser. No. 653,524

Claims priority, application Japan, Sep. 26, 1983, 58-176224

Int. Cl.[4] H04L *7/08*; H04J *3/06*; H04N *1/36*

U.S. Cl. 375—116 **15 Claims**



1. A framing code detector for a teletext receiver capable of

receiving different broadcasting teletext signals each having a different framing code, the framing code being repeated a plurality of times in each broadcast teletext signal comprising:

memory means for storing a pattern code corresponding to an anticipated one of said plurality of framing codes;

comparing means for comparing a received framing code with said pattern code stored in said memory means to produce an output signal when a substantial predetermined correspondence is detected between said received framing code and said stored pattern code;

counter means for counting the generation of said output signal of said comparing means during a predetermined period during which a framing code of a given broadcasting teletext signal is received a plurality of times by said comparing means; and

control means for writing another pattern code into said memory means when the count value in said counter means is less than a predetermined value at the end of said predetermined period and for producing an identification signal when said count value in said counter means is equal to or greater than said predetermined value at the end of said predetermined period.

4,638,498

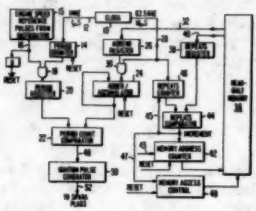
DIGITAL TIMING SYSTEM

Joseph O. Sinniger, Pennington, and Anthony D. Robbi, Hopewell, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 437,836, Oct. 29, 1982, Pat. No. 4,575,809, which is a division of Ser. No. 161,454, Jun. 20, 1980, Pat. No. 4,375,209. This application Sep. 27, 1985, Ser. No. 780,898

Int. Cl.[4] G06M *3/02*; F02P *5/04*

U.S. Cl. 377—39 **3 Claims**



1. A system for producing an output pulse at a time which is a function of the spacing of two input pulses, comprising

a source of clock pulses,

a counter connected to count the number of clock pulses occurring in the period between said two input pulses,

a source of an addend quantity,

adder/accumulator means responsive to said source of clock pulses and to said source of an addend quantity to repeatedly add said addend quantity, and

a comparator producing an output pulse when the sum provided by said adder/accumulator corresponds with the counted number of clock pulses.

4,638,499

HIGH RESOLUTION COLLIMATOR SYSTEM FOR X-RAY DETECTOR

Jeffrey W. Eberhard, Schenectady, and Dallas E. Cain, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 638,171, Aug. 6, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 875,021

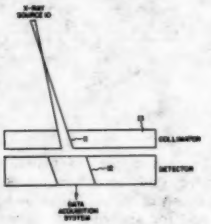
Int. Cl.[4] G21K *1/02*

U.S. Cl. 378—7 **3 Claims**

1. A high resolution collimator/detector for a computerized tomography system having a source of X-ray beams to irradiate an object, comprising:

an X-ray detector including an array of wide detector elements comprised of a printed circuit detector board having a collector plate divided into wide strips and a parallel voltage plate between which is impressed an electric field;

a housing having an X-ray transparent section and a chamber containing said detector board and voltage plate and a high pressure gaseous medium to convert incident X-rays into charged particles that drift under the influence of said electric field;



a collimator secured to said detector housing comprised of a central layer in which narrow tapered slits are cut and continuous enclosing side layers, said central layer having at the top flexure pieces each pressed toward an edge of the respective slit to yield a controlled slit width at the top of 3 mils or less to limit and define the width of X-ray beams incident on said detector elements and hence the system resolution;

every narrow tapered slit being approximately centered on one wide detector element which collects all the charged particles formed in that element, and having a length equal to the thickness of said central layer which determines the slice thickness of said computerized tomography system.

4,638,500

METHOD OF DETERMINING VOLTAGE AND CURRENT FOR A GIVEN OPERATING PERIOD OF AN X-RAY SOURCE

Wigle F. Smits, Emmasingel, and Willem E. Spaak, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

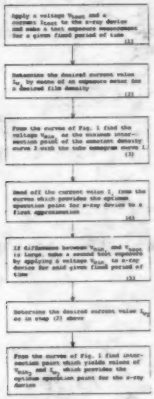
Continuation of Ser. No. 512,920, Oct. 7, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,427

Int. Cl.[4] H05G *1/46*

U.S. Cl. 378—109 **6 Claims**

1. A method of determining voltage and current values to be applied to an x-ray source and associated with a given exposure period of the x-ray source in which a desired current time product is determined with the aid of an x-ray exposure meter for a desired radiation quantity comprising, determining the current time product at a given voltage applied to the radiation source, and determining, with the aid of a voltage-current function related to the desired radiation quantity, which function is passed through the current intensity associated with the desired current time product, and with the aid of an operating range limitation nomogram of the X-ray source with the same current scale as the voltage-current function, the point of

intersection of the voltage-current function and the operating range limitation nomogram having the lowest voltage value,



said lowest voltage value being taken as a target value for the current determination with the aid of the load nomogram.

4,638,501

FRONT PLATE OF X-RAY FILM CASSETTE

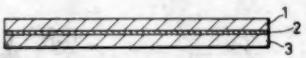
Yoshitsugu Nishi, and Yukitaka Daigo, both of Saitama, Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,037

Claims priority, application Japan, Oct. 14, 1983, 58-158039[U]

Int. Cl.⁴ G03B *42/04*

U.S. Cl. 378—182 **10 Claims**



1. A front plate of an X-ray film cassette, comprising:

a multi-layer laminated body having

(i) an intermediate layer made of carbon fiber reinforced plastic; and

(ii) outer layers made of aromatic polyamide fiber reinforced plastic for covering both surfaces of said intermediate layer, wherein said intermediate layer and said outer layers are formed in an integrally laminated body.

4,638,502

ANTHROPOMORPHIC PHANTOMS

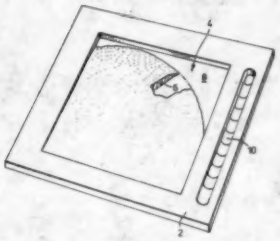
Martin J. Yaffe, Toronto, Canada, assignor to The Ontario Cancer Institute, Toronto, Canada

Filed Jul. 8, 1985, Ser. No. 753,025

Int. Cl.⁴ G01D *18/00*

U.S. Cl. 378—207 **22 Claims**

1. A method for producing a radiological phantom comprising obtaining a radiograph representing a radiographic image of a particular view of a body part to be simulated in a defined radiographic environment, densitometrically scanning the radiograph with a densitometer, digitizing and sampling the densitometer output at a sampling rate sufficient to produce data defining a densitometric image of the body part having a spatial resolution sufficient that the phantom can substantially reproduce the original radiograph when imaged in the same environment, obtaining the phantom, such as to relate radiographic density to material thickness in the radiographic environment used for obtaining the radiograph and over a range of densities comprising the density range of the radiograph, using the calibration data to translate the densitometric data defining the image into thickness data, and using said thickness data to form from the same material as the sample a three dimensional



representation of the thickness data configured to overlay a radiographic image plane and to produce in said defined radiographic environment an image similar to that which would have been produced by said particular view of the original body part in that environment.

4,638,503

FULLY COMPATIBLE AM STEREOPHONIC TRANSMITTING SYSTEM

Charles S. Wright, Springfield, Va., assignor to Delta Electronics, Alexandria, Va.

Filed Feb. 20, 1985, Ser. No. 703,681

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—16 **8 Claims**

1. Apparatus for transmitting in quadrature a single carrier signal carrying information corresponding to first and second signals including means supplying said first, second, and carrier signals, said apparatus further comprising:

(a) means for providing a third signal indicative of the difference of said first and second signals and a fourth signal indicative of the sum of said first and second signals;

(b) means responsive to a feedback signal for phase modulating said carrier signal in accordance with said feedback signal;

(c) feedback means for providing said feedback signal and comprising means for detecting a component of said phase modulated carrier signal in phase with said carrier signal to provide an in phase signal and detecting a gomponent of said phase modulated carrier signal out of phase with said carrier signal to provide a quadrature signal;

(d) means for multiplying respectively said in phase and quadrature signals by said third and fourth signals to provide first and second multiplied signals;

(e) means for obtaining the difference of said first and second multiplied signals to provide said feedback signal whereby said phase modulating means phase modulates said carrier signal in accordance with the ratio of said third signal to said fourth signal; and

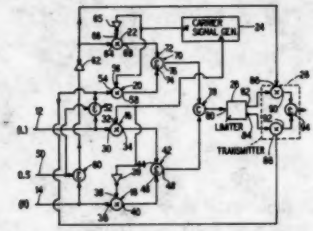
(f) means for amplitude modulating said phase modulated carrier signal in accordance with said third signal, said transmitted carrier signal being fully compatible for reception and reproduction of said third signal with substantially no distortion.

4,638,504

INDEPENDENT CHANNEL MODULATION SYSTEM FOR AM STEREO

Stanley Salek, Mesa, Ariz., assignor to Broadcast Electronics, Inc., Quincy, Ill.

Filed Jun. 28, 1985, Ser. No. 749,814
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—16 12 Claims



1. An independent channel modulation system for generating a signal to be transmitted for use with a generator for generating first, second, third and fourth carrier signals comprising:

first and second input terminals;

a first modulator connected to said first input and to said means for generating said first carrier signal for modulating said first carrier signal with a signal from said first input;

a second modulator connected to said second input and to said means for generating said second carrier signal for modulating said second carrier signal by a signal from said second input;

a third modulator connected to said first input and to said means for generating said third carrier signal for modulating said third carrier signal by a signal from said first input;

a fourth modulator connected to said second input and to said means for generating said fourth carrier signal for modulating said fourth carrier signal by a signal from said second input;

first summing means connected for summing the outputs of said first and second modulators;

second summing means connected for summing the outputs of said third and fourth modulators; and

third summing means connected for summing the outputs of said first and second summing means, said third summing means having an output for said signal to be transmitted.

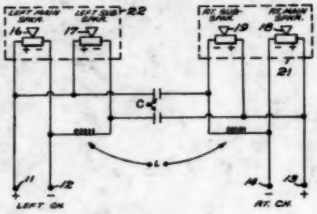
4,638,505

OPTIMIZED LOW FREQUENCY RESPONSE OF LOUDSPEAKER SYSTEMS HAVING MAIN AND SUB-SPEAKERS

Matthew S. Polk, and Colin B. Campbell, both of Baltimore, Md., assignors to Polk Audio Inc., Baltimore, Md.

Filed Aug. 26, 1985, Ser. No. 769,345
Int. Cl.[4] H04R 5/00
U.S. Cl. 381—24 5 Claims

1. A loudspeaker system for a stereophonic sound reproduction system having a right channel output signal R with plus and minus output terminals and a left channel output signal L with plus and minus output terminals, said loudspeaker system comprising a right main speaker and a right sub-speaker, a left main speaker and a left sub-speaker, each of said main speakers and sub-speakers having plus and minus input terminals, interspeaker cabling means for applying signal R to said right main speaker, and a signal R-L to said right sub-speaker, and a signal L to said left main speaker and a signal L-R to said left subspeaker, said interspeaker cabling means including impedance means having values selected to substantially attenuate the −L portion of the R-L applied to the right sub-speaker signal and



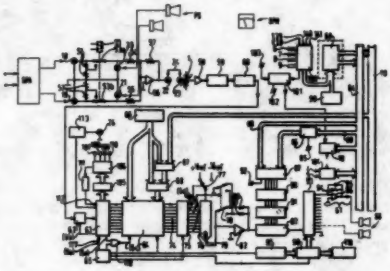
the −R portion of the L-R signal applied to the left subspeaker for signal frequencies of below approximately 200 Hz.

4,638,506

SOUND FIELD SIMULATION SYSTEM AND METHOD FOR CALIBRATING SAME

Hok L. Han, No. 67 Thorbeckestraat, 2613 BV Delft, Netherlands

Continuation of Ser. No. 574,639, Jan. 30, 1984, abandoned, which is a continuation of Ser. No. 305,198, Sep. 24, 1981, abandoned. This application Mar. 4, 1985, Ser. No. 707,527
Int. Cl.[4] H03G 3/00
U.S. Cl. 381—34 4 Claims



1. In the method of calibrating a sound field simulation system which comprises the steps of:

(a) switching off secondary loudspeaker units of the simulation system;

(b) generating a first sound source sound at least predominantly corresponding to pink noise;

(c) measuring the sound pressure level of the first sound source sound generated in step (b);

(d) switching on the secondary loudspeaker units;

(e) producing a second sound source sound from said secondary loudspeaker units corresponding to said pink noise of step (b);

(f) measuring the sound pressure level of said second sound source sound; and

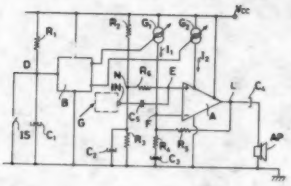
(g) adjusting the level of said second sound source sound as measured in step (f) to the level measured in step (c) or differing therefrom by a chosen amount.

4,638,507

AUDIO AMPLIFIER SWITCH-ON CONTROL CIRCUIT

Sergio Palara, Bareggio, and Aldo Torazzina, Monza, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Apr. 12, 1985, Ser. No. 722,386
Claims priority, application Italy, Apr. 20, 1984, 20645 A/84
Int. Cl.[4] H03F 1/26
U.S. Cl. 381—94 11 Claims



1. Audio amplifier switch-on control circuit in an audio signal generating apparatus, comprising:

a progressively chargeable capacitor, which charges when said apparatus is turned on; and

an oscillating circuit which responds to an increase in a load voltage of said capacitor beyond a preset value to progressively shift from a first to a second operating state, in which a switch-on current for switching on the audio amplifier, is produced

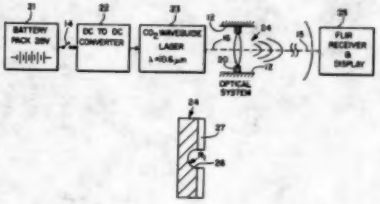
said oscillating circuit including two commutating devices, each of which are controllable by an electrical signal, a first of which being controlled by a load voltage of said capacitor and a second of which being controlled by the state of said first commutating device, said second commutating device causing said oscillating circuit to assume said first operating state after said load voltage reaches said preset value.

4,638,508

PORTABLE FLIR BEACON

Robert T. Hintz, China Lake, and Roy L. Nichols, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1978, Ser. No. 895,407
Int. Cl.[4] H04B 9/00; G02B 3/00
U.S. Cl. 455—617 8 Claims



1. A radiant energy signal system comprising:

a portable housing configured for manual manipulation to a predetermined spatial orientation with respect to an operator thereof for aiming said signal system;

a source of electrical energy mounted within said portable housing;

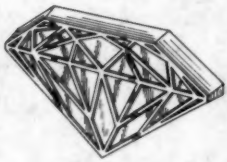
an electro-optical transducer means mounted within said portable housing and effectively connected to said source of electrical energy for producing a radiant energy signal having a wavelength within the eight-to-twelve micron range; and

an optical element effectively mounted within said housing and in optical alignment with said electro-optical transducer means and configured to have two cylindrical concave surfaces of different radii with axes at right angles and on the same surface thereof to direct said radiant energy into a fan shaped beam which with said predetermined spatial orientation causes said radiant energy signal to impinge a desired receptor.

DESIGNS

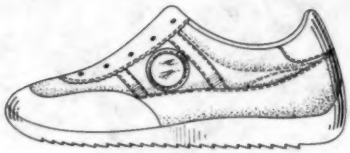
JANUARY 20, 1987

287,780
CANDY
Robert J. Farber, 2423 Brookwood Dr., Flossmoor, Ill. 60422
Filed May 25, 1983, Ser. No. 498,110
Term of patent 14 years
U.S. Cl. D1—106

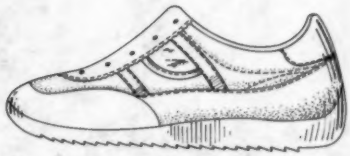


287,781
EDIBLE CHRISTMAS TREE
Gunter Schmidt, Bahnhofstr. 23, 2832 Twistringen, Fed. Rep. of Germany
Filed Nov. 14, 1984, Ser. No. 671,299
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 25 MR 10
Term of patent 14 years
U.S. Cl. D1—115

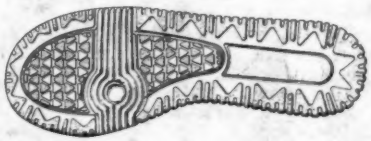
287,782
SHOE
Jorge E. M. Palacio, Col. del Valle, Mexico, assignor to Calzado Puma, S.A. de C.V., Edo. de Mexico, Mexico
Division of Ser. No. 544,354, Oct. 21, 1983. This application Sep. 24, 1985, Ser. No. 779,493
Term of patent 14 years
U.S. Cl. D2—309



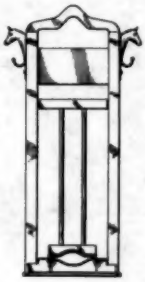
287,783
SHOE
Jorge E. M. Palacio, Col. del Valle, Mexico, assignor to Calzado Puma, S.A. de C.V., Edo. de Mexico, Mexico
Division of Ser. No. 544,354, Oct. 21, 1983. This application Sep. 24, 1985, Ser. No. 779,511
Term of patent 14 years
U.S. Cl. D2—309



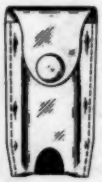
287,784
SHOE SOLE
James K. Tong, Beaverton, and Bruce MacGregor, Lake Oswego, both of Oreg., assignors to Pensa, Inc., Portland, Oreg.
Filed Dec. 17, 1985, Ser. No. 809,749
Term of patent 14 years
U.S. Cl. D2—320



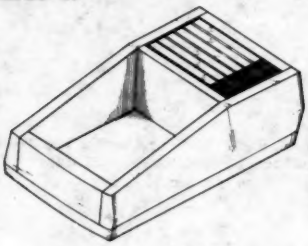
287,785
BOOTJACK
Charles L. Lauhoff, Rte. 2, Box 578, Amarillo, Tex. 79101
Filed Jun. 22, 1984, Ser. No. 623,414
Term of patent 14 years
U.S. Cl. D2—642

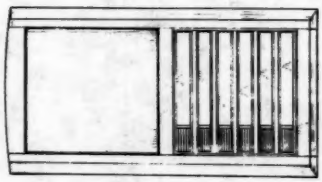


287,786
CIGARETTE LIGHTER HOLDER
Willard C. Knight, 2118 Schomburg, Fort Wayne, Ind. 46808
Filed Mar. 22, 1984, Ser. No. 592,094
Term of patent 14 years
U.S. Cl. D3—106

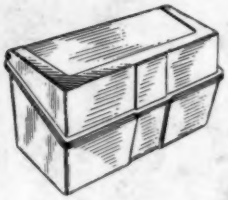


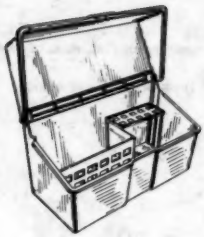
287,787
CASSETTE TAPE HOLDER
Richard S. Dunchock, South Laguna, Calif., assignor to SL Corporation, Troy, Mich.
Filed Aug. 20, 1984, Ser. No. 642,532
Term of patent 14 years
U.S. Cl. D3—35



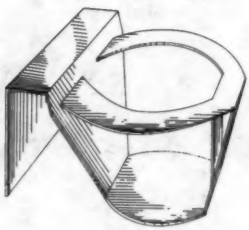


287,788
ORGANIZER AND STORAGE CONTAINER FOR BATHROOM SUPPLIES
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Jul. 13, 1984, Ser. No. 630,827
Term of patent 14 years
U.S. Cl. D3—39

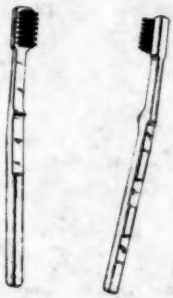




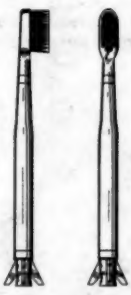
287,789
DRINK CUP HOLDER FOR AN AUTOMOBILE
Jon T. Johnson, 6071 Stanleyville Dr., Rural Hall, N.C. 27045
Filed Jul. 9, 1984, Ser. No. 629,184
Term of patent 14 years
U.S. Cl. D3—40



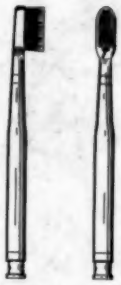
287,790
TOOTHBRUSH
Andreas Fay, Vienna, Austria, assignor to Lever Brothers Company, New York, N.Y.
Filed Mar. 6, 1985, Ser. No. 709,243
Claims priority, application Austria, Sep. 6, 1984, 533644
Term of patent 14 years
U.S. Cl. D4—104



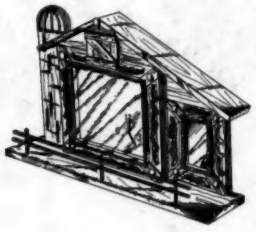
287,791
TOOTH BRUSH
Daniel Arnaud, 41 rue Chambre de l'Edit, Castres 81100, France
Filed Jul. 27, 1983, Ser. No. 517,946
Term of patent 14 years
U.S. Cl. D4—107



287,792
TOOTH BRUSH
Daniel Arnaud, 41 rue Chambre de l 'Edit, Castres 81100, France
Filed Oct. 31, 1983, Ser. No. 546,868
Term of patent 14 years
U.S. Cl. D4—107

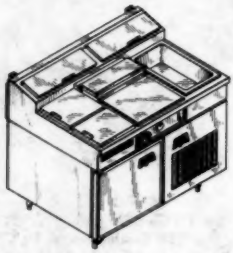


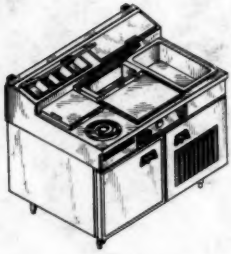
287,793
PICTURE FRAME
Robert E. Johnson, Box 112, Castlewood, S. Dak. 57223
Division of Ser. No. 461,591, Jan. 27, 1983, Pat. No. Des. 283,085. This application Oct. 15, 1985, Ser. No. 787,778
Term of patent 14 years
U.S. Cl. D6—303



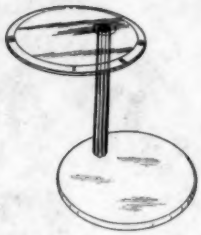
287,794
BAR STOOL
Vladimir W. Zakharov, Baldwin Park, Calif., assignor to Mikhail Darafeev, Inc., Baldwin Park, Calif.
Filed Feb. 19, 1985, Ser. No. 702,577
The portion of the term of this patent subsequent to Nov. 4, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—360

287,795
FOOD PREPARATION TABLE FOR PASTAS, SANDWICHES AND THE LIKE
Gary Streepy, Witchita, Kans., assignor to Pizza Hut, Inc., Wichita, Kans.
Filed Mar. 21, 1984, Ser. No. 592,334
Term of patent 14 years
U.S. Cl. D6—436

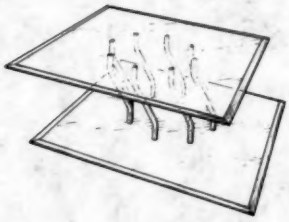




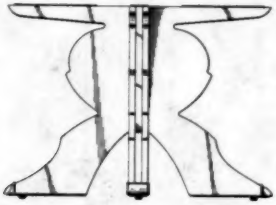
287,796
TABLE
Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 10, 1984, Ser. No. 598,821
Term of patent 14 years
U.S. Cl. D6—483



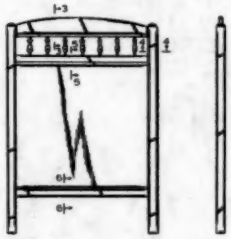
287,797
TABLE
Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Apr. 10, 1984, Ser. No. 598,822
Term of patent 14 years
U.S. Cl. D6—483



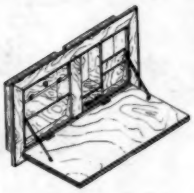
287,798
TABLE BASE
Robert Venturi, Philadelphia, Pa., assignor to Knoll International, Inc., New York, N.Y.
Filed Feb. 22, 1984, Ser. No. 582,325
Term of patent 14 years
U.S. Cl. D6—498



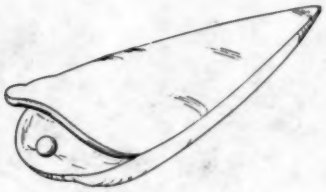
287,799
CRIB FOOTBOARD
Merlin A. Brunner, New London, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Jul. 30, 1984, Ser. No. 635,879
Term of patent 14 years
U.S. Cl. D6—505



287,800
BUILT-IN WALL CABINET
Layton G. Lance, P.O. Box 1472, St. Charles, Mo. 63302
Filed Mar. 19, 1984, Ser. No. 590,787
Term of patent 14 years
U.S. Cl. D6—559



287,801
PAJAMA BAG/PILLOW
Beverly K. O'Brien, 83 Bridle Path Rd., Southbury, Conn. 06488
Filed Jan. 16, 1984, Ser. No. 570,826
Term of patent 14 years
U.S. Cl. D6—597



287,802
COVERED SERVING TRAY OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 31, 1984, Ser. No. 646,386
Term of patent 14 years
U.S. Cl. D7—17

287,803

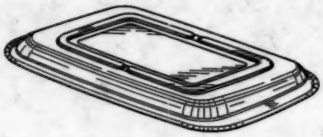
CASSEROLE DISH COVER OR THE LIKE

Robert H. C. M. Daenen, Hekelgem; Pieter K. J. DeCoster, Aalst, both of Belgium, and Martin J. Wolff, North Providence, R.I., assignors to Dart Industries Inc., Northbrook, Ill.

Filed Sep. 21, 1984, Ser. No. 653,388

Term of patent 14 years

U.S. Cl. D7—40



287,804

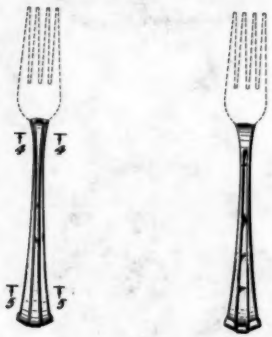
HANDLE FOR AN ARTICLE OF FLATWARE

Richard O. Cragin, Lincoln, R.I., assignor to Textron Inc., Providence, R.I.

Filed Oct. 18, 1984, Ser. No. 663,468

Term of patent 14 years

U.S. Cl. D7—152



287,805

INSULATED JUG

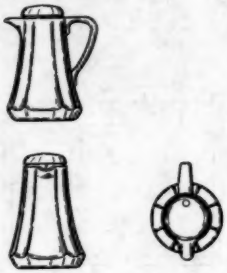
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Dr. Anso Zimmermann Isolierflaschen, Niedersula, Fed. Rep. of Germany

Filed Feb. 14, 1984, Ser. No. 580,145

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 8AR 206/83

Term of patent 14 years

U.S. Cl. D7—317



287,806

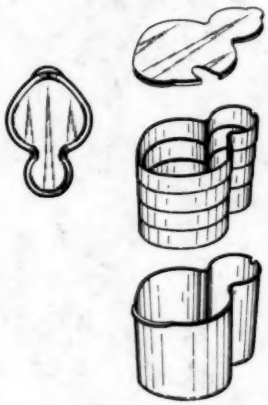
WATER CARAFE

Harlan F. Borin, 4049 Arcadia Way, Ocean Hills, Calif. 92056

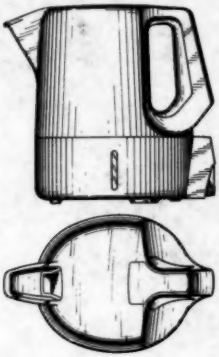
Filed Aug. 9, 1984, Ser. No. 639,023

Term of patent 14 years

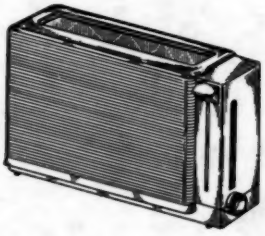
U.S. Cl. D7—317



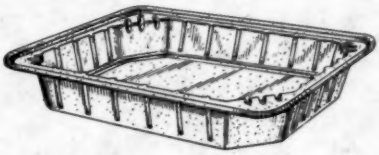
287,807
ELECTRIC KETTLE
Ian G. Wilson, New South Wales, Australia, assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Sep. 21, 1984, Ser. No. 653,811
Term of patent 14 years
U.S. Cl. D7—317



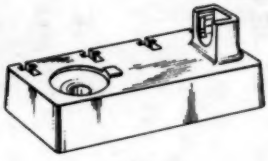
287,808
TOASTER
Franz A. Stutzer, and Michael Knochner, both of Offenbach, Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Fed. Rep. of Germany
Filed Nov. 28, 1984, Ser. No. 675,688
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 5MR10533; Sep. 28, 1984, 5MR10561
Term of patent 14 years
U.S. Cl. D7—330



287,809
ROASTER
Frederick D. Alexander, Arlington Heights, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Jun. 28, 1985, Ser. No. 750,426
Term of patent 14 years
U.S. Cl. D7—359

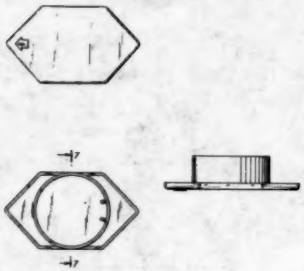


287,810
BASE FOR KITCHEN APPLIANCE
Robert Osit, Annapolis, Md., assignor to Black & Decker, Inc., Newark, Del.
Filed Sep. 19, 1984, Ser. No. 652,059
Term of patent 14 years
U.S. Cl. D7—412

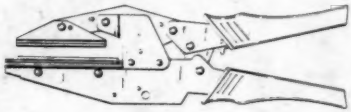


287,811
TIRE REPAIR TOOL
Vincent A. Walla, 420 Galway Dr., Bethel Park, Pa. 15102
Filed Feb. 21, 1984, Ser. No. 582,026
Term of patent 14 years
U.S. Cl. D8—31

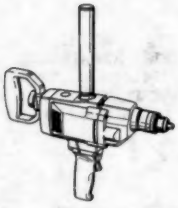
287,812
SAFETY BOTTLE CAP REMOVER
Frank Bordonaro, Saddlebrook, and James McTiernan, Woodcliff Lake, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Mar. 14, 1984, Ser. No. 589,618
Term of patent 14 years
U.S. Cl. D8—40



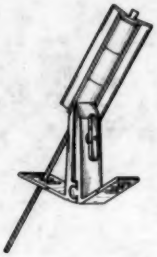
287,813
CRIMPING TOOL
Jan O. Hägg, Stenhamra, and Lars-Olov Persson, Älvdalen, both of Sweden, assignors to Pressmaster Tool AB, Älvdalen, Sweden
Filed Feb. 14, 1984, Ser. No. 579,963
Term of patent 14 years
U.S. Cl. D8—51



287,814
ELECTRIC DRILL
Etsuo Hiraishi; Tetsuyuki Doi, and Hiroshi Morikawa, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Feb. 10, 1984, Ser. No. 579,051
Claims priority, application Japan, Aug. 20, 1983, 58-36385
Term of patent 14 years
U.S. Cl. D8—67

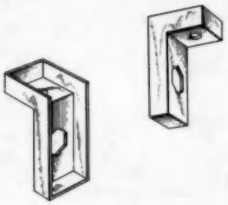


287,815
KNIFE BLADE SHARPENER OR THE LIKE
Donald R. Johannsen, Dearborn, Mich., assignor to Bonnis S. Carris, Detroit, Mich.
Filed Jan. 13, 1984, Ser. No. 570,583
Term of patent 14 years
U.S. Cl. D8—93



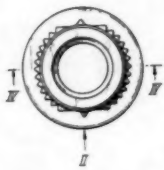
287,816
CUP HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Mar. 20, 1985, Ser. No. 714,179
Term of patent 14 years
U.S. Cl. D8—367

287,817
FRAME MOUNTING BRACKET FOR A SWINGING DOOR
Kirk Henin, Manhasset, N.Y., assignor to Harris Hardware Sales Corp., Port Washington, N.Y.
Filed Aug. 15, 1985, Ser. No. 765,838
Term of patent 14 years
U.S. Cl. D8—380



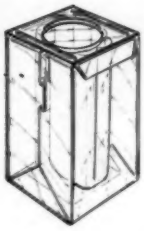
287,818
SCREW-THREADED INSERT
Stephen R. Bullen, Honeybourne, Nr. Evesham; Paul M. Dunn, and Martin A. Phillips, both of Redditch, all of England, assignors to Dynacast International Limited, England
Filed Nov. 16, 1984, Ser. No. 672,140
Claims priority, application United Kingdom, May 18, 1984, 1019772
Term of patent 14 years
U.S. Cl. D8—385

287,819
SCREW-THREADED INSERT
Stephen R. Bullen, Honeybourne, nr. Evesham; Paul M. Dunn, and Martin A. Phillips, both of Redditch, all of England, assignors to Dynacast International Limited, England
Filed Nov. 16, 1984, Ser. No. 672,196
Claims priority, application United Kingdom, May 18, 1984, 1019774
Term of patent 14 years
U.S. Cl. D8—385



287,820
SCREW-THREADED INSERT
Stephen R. Bullen, Honeybourne, nr. Evesham; Paul M. Dunn, and Martin A. Phillips, both of Redditch, all of England, assignors to Dynacast International Limited, England
Filed Dec. 26, 1984, Ser. No. 686,393
Claims priority, application United Kingdom, Jul. 3, 1984, 1020710
Term of patent 14 years
U.S. Cl. D8—385

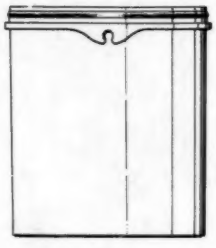
287,821
PACKAGING CONTAINER FOR A BOTTLE OR THE LIKE
Robert D. Holewinski, Lakehurst; Leslie Hamilton, Trenton, and William J. Blatherwick, Hamilton Square, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Apr. 9, 1984, Ser. No. 597,900
Term of patent 14 years
U.S. Cl. D9—341



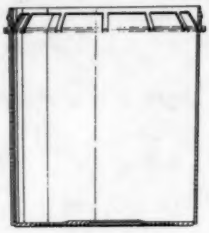
287,822
CONTAINER FOR REFRIGERANT GEL OR THE LIKE
Stanley A. Katz, Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Apr. 10, 1984, Ser. No. 598,795
Term of patent 14 years
U.S. Cl. D9—407

287,823
BOTTLE, OR SIMILAR ARTICLE
Karen A. Rosenwinkel, Oak Park, Ill., assignor to W. Braun Company, Chicago, Ill.
Filed Apr. 9, 1984, Ser. No. 598,228
Term of patent 14 years
U.S. Cl. D9—413

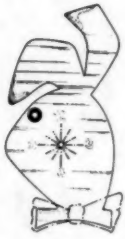
287,824
CONTAINER FOR LIQUIDS
Adrien P. Rayner, Iver, England, assignor to Metal Box p.l.c., Reading, England
Filed May 27, 1983, Ser. No. 498,657
Term of patent 14 years
U.S. Cl. D9—428



287,825
CONTAINER FOR LIQUIDS
Adrien P. Rayner, Iver, England, assignor to Metal Box p.l.c., Reading, England
Filed May 27, 1983, Ser. No. 499,316
Term of patent 14 years
U.S. Cl. D9—428

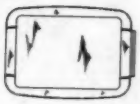


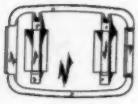
287,826
CLOCK
Fernando C. Richards, 56 Peabody St., Salem, Mass. 01970
Filed Feb. 23, 1984, Ser. No. 583,056
Term of patent 14 years
U.S. Cl. D10—7



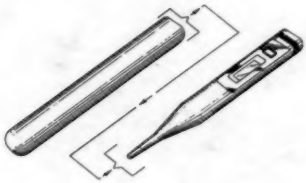
287,827
HEAD FOR A DIFFERENTIAL PRESSURE MEASURING AND TRANSMITTING HOUSING
David A. Broden, Chanhassen, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.
Filed Sep. 6, 1983, Ser. No. 529,883
Term of patent 14 years
U.S. Cl. D10—46

287,828
DOSIMETER FOR MONITORING RADIATION EXPOSURE
Robert Pollock, Aurora, Ill.; Douglas Patton; David Sharbaugh, both of Irvine, Calif., and John Goodin, Long Beach, Calif., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.
Filed Feb. 28, 1983, Ser. No. 468,117
Term of patent 14 years
U.S. Cl. D10—47

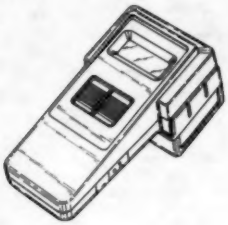




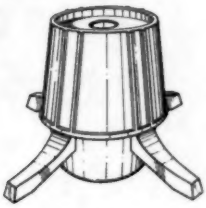
287,829
COMBINED ELECTRONIC THERMOMETER AND COVER THEREFOR
Kazumi Osaka, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 3, 1984, Ser. No. 607,016
Claims priority, application Japan, Nov. 4, 1983, 58-47932
Term of patent 14 years
U.S. Cl. D10—57



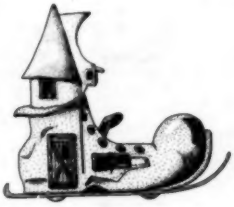
287,830
ELECTRONIC THERMOMETER OR SIMILAR ARTICLE
Bernhard Schwan, Werbach-Gamburg, Fed. Rep. of Germany, assignor to Atmos Fritzsching & Co. GmbH, Viernheim, Fed. Rep. of Germany
Filed Apr. 6, 1984, Ser. No. 597,370
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, MR 139
Term of patent 14 years
U.S. Cl. D10—57



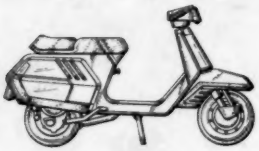
287,831
STAND FOR TREES, POLES OR SIMILAR ARTICLE
Gerhard Stephan, Ottawa, Canada, assignor to Ava Tech International Ltd. and M. R. St. Jacques Associates, Inc., both of Ottawa, Canada
Filed May 30, 1984, Ser. No. 615,126
Claims priority, application Canada, Feb. 16, 1984, 16-02-84-2
Term of patent 14 years
U.S. Cl. D11—130.1



287,832
VEHICLE
Margaret A. H. Byrd, 14811 Wildwood, Magnolia, Tex. 77355
Filed Apr. 30, 1984, Ser. No. 605,300
Term of patent 14 years
U.S. Cl. D12—83

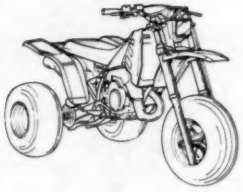


287,833
MOTORCYCLE
Giulia Moselli, Turin, Italy, assignor to Yeu Tyan Machinery Mfg., Co., Ltd., Chung HWA, Taiwan
Filed Jan. 2, 1985, Ser. No. 688,414
Term of patent 14 years
U.S. Cl. D12—110



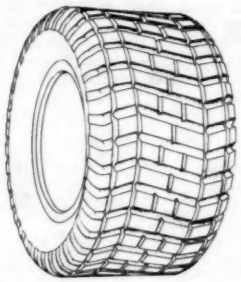
287,834
MOTORCYCLE
Kentaro Ito, and Chiharu Sasaki, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1984, Ser. No. 583,253
Claims priority, application Japan, Aug. 29, 1983, 58-37646
Term of patent 14 years
U.S. Cl. D12—110

287,835
MOTOR TRICYCLE
Akio Makita; Toru Nishino, both of Tokyo, and Tetsuya Nakazawa, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1984, Ser. No. 613,511
Claims priority, application Japan, Nov. 24, 1983, 58-50964
Term of patent 14 years
U.S. Cl. D12—110



287,836
MOTORIZED WHEELCHAIR
Wilfred Chan; Michael Marr, and Augusto De Sousa, all of Toronto, Canada, assignors to Fortress Scientific Limited, Ontario, Canada
Filed Oct. 1, 1984, Ser. No. 656,499
Claims priority, application Canada, May 30, 1984, 30-05-84-7
Term of patent 14 years
U.S. Cl. D12—131

287,837
VEHICLE TIRE
Hisashi Shintomi, Izumi-Ohtsu, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Nov. 28, 1984, Ser. No. 675,581
Claims priority, application Japan, Jun. 30, 1984, 59-27169
Term of patent 14 years
U.S. Cl. D12—140

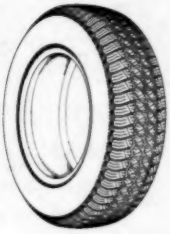


287,838
AUTOMOBILE TIRE
Kenji Takehara, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Oct. 9, 1984, Ser. No. 658,875
Claims priority, application Japan, May 28, 1984, 59-21857
Term of patent 14 years
U.S. Cl. D12—143

287,839
AUTOMOBILE TIRE
Mitsuteru Miyata, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 17, 1984, Ser. No. 611,077
Claims priority, application Japan, Mar. 28, 1984, 59-12265
Term of patent 14 years
U.S. Cl. D12—146

287,840
AUTOMOBILE TIRE
Masaharu Ono, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 10, 1984, Ser. No. 648,938
Claims priority, application Japan, Jul. 25, 1984, 59-31359
Term of patent 14 years
U.S. Cl. D12—147

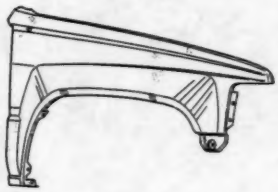
287,841
AUTOMOBILE TIRE
Masaharu Ono, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Sep. 10, 1984, Ser. No. 648,941
Claims priority, application Japan, Jul. 25, 1984, 59-31360
Term of patent 14 years
U.S. Cl. D12—147



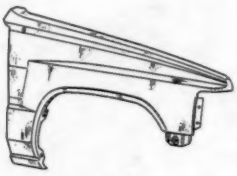
287,842
AUTOMOBILE TIRE
Kenji Hatakenaka, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Kobe, Japan
Filed May 16, 1984, Ser. No. 610,793
Claims priority, application Japan, Mar. 28, 1984, 59-12268
Term of patent 14 years
U.S. Cl. D12—151

287,843
RADIATOR GRILLE FOR AN AUTOMOBILE
Mitsuo Katoh, and Hiroki Amano, both of Hachioji, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jun. 19, 1984, Ser. No. 622,281
Term of patent 14 years
U.S. Cl. D12—163

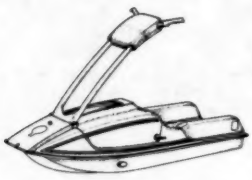
287,844
FRONT FENDER FOR AN AUTOMOBILE
Kintaro Matsumoto, Hino; Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,654
Term of patent 14 years
U.S. Cl. D12—184



287,845
FRONT FENDER FOR AN AUTOMOBILE
Kintaro Matsumoto, Hino; Mitsuo Kato, and Hideto Kikuchi, both of Hachioji, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 7, 1984, Ser. No. 638,655
Term of patent 14 years
U.S. Cl. D12—184

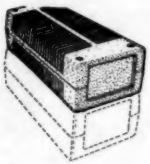


287,846
MOTORBOAT
Hiroshi Nishida, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Mar. 1, 1984, Ser. No. 585,168
Term of patent 14 years
U.S. Cl. D12—307



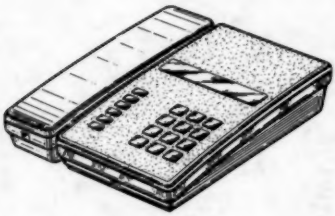
287,847
PONTOON
William Bobinac, 124 Letcher Street, Sault Ste. Marie, Ontario P6C 4X8, Canada
Filed May 7, 1984, Ser. No. 607,775
Term of patent 14 years
U.S. Cl. D12—317

287,848
MODULAR POWER SUPPLY HOUSING
Leroy B. Keely, Portola Valley; Diab E. Freige, Los Altos, and Michael J. Nuttall, Palo Alto, all of Calif., assignors to Convergent Technologies, Inc., San Jose, Calif.
Filed May 8, 1984, Ser. No. 608,065
Term of patent 14 years
U.S. Cl. D13—11

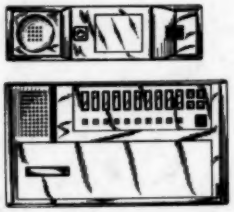


287,849
COMMUNICATIONS HEADSET
Kieran O'Malley, Louisburgh; John Preisler, Riverside, and Bernie Larkin, Callan, all of Ireland, assignors to Northern Telecom Limited, Montreal, Canada
Filed Sep. 21, 1984, Ser. No. 653,129
Claims priority, application Canada, Mar. 23, 1984, 23-03-84-1
Term of patent 14 years
U.S. Cl. D14—36

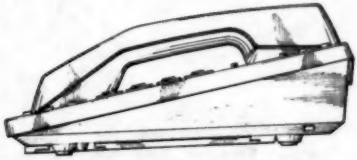
287,850
TELEPHONE SET
Eric J. Marshall, London, England, assignor to The Marshall Telephone Corporation Limited, Kent, England
Filed Mar. 2, 1984, Ser. No. 585,865
Term of patent 14 years
U.S. Cl. D14—53



287,851
HANDSET AND STAND TELEPHONE UNIT
Winter W. Y. Hoi, Kowloon, Hong Kong, assignor to Elec & Eltek Company Limited, Kowloon, Hong Kong
Filed Jul. 25, 1984, Ser. No. 634,413
Claims priority, application United Kingdom, Jan. 25, 1984, 1017504
Term of patent 14 years
U.S. Cl. D14—53

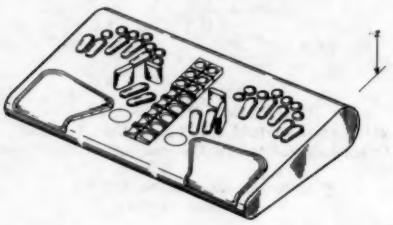


287,852
TELEPHONE STATION SET
Wilbert C. Brown, Fairfield, and Philip B. Saba, Trumbull, both of Conn., assignors to TIE/Communications, Inc., Shelton, Conn.
Filed May 3, 1984, Ser. No. 606,891
Term of patent 14 years
U.S. Cl. D14—58

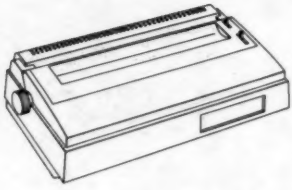


287,853
RADIO
Paul F. Siegel, Ridgefield, Conn., assignor to Sun Hill Industries, Inc., Stamford, Conn.
Filed Sep. 28, 1984, Ser. No. 656,099
Term of patent 14 years
U.S. Cl. D14—70

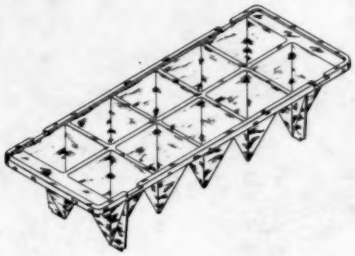
287,854
KEYBOARD
Jay A. Crews, 721 Johnson Ave., San Luis Obispo, Calif. 93401
Filed Feb. 21, 1984, Ser. No. 581,588
Term of patent 14 years
U.S. Cl. D14—100



287,855
PRINTER
Toshio Yamamoto, Kanagawa, Japan, assignor to Ricoh Company Ltd., Japan
Filed Oct. 1, 1984, Ser. No. 656,449
Claims priority, application Japan, Mar. 30, 1984, 59-012392
Term of patent 14 years
U.S. Cl. D14—111

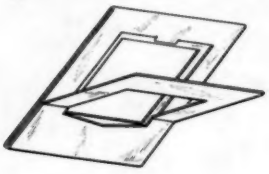


287,856
ICE CUBE TRAY
Ray F. Stewart, 2567 Hampton Ave., Redwood City, Calif. 94061
Filed Sep. 19, 1983, Ser. No. 533,307
Term of patent 14 years
U.S. Cl. D15—90

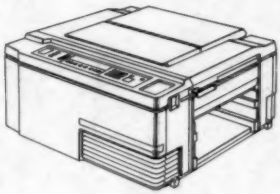


287,857
CUTTER FOR A SHEET OF FILM, PAPER, PLASTIC OR THE LIKE
Junichi Inoue, Tokyo, Japan, assignor to Yotsuwa Sangyo & Co., Ltd., Tokyo, Japan
Filed Apr. 10, 1984, Ser. No. 598,586
Claims priority, application Japan, Oct. 18, 1983, 58-44886
Term of patent 14 years
U.S. Cl. D15—139

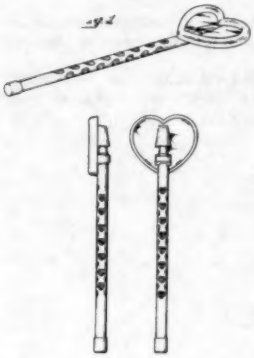
287,858
TRANSPARENCY MOUNT FOR OVERHEAD PROJECTORS
Arild O. Gautestad, Plommeveien 5A, N-4600 Kristiansand S., Norway
Filed Feb. 22, 1983, Ser. No. 468,206
Claims priority, application Norway, Aug. 19, 1982, 63.191
Term of patent 14 years
U.S. Cl. D16—26



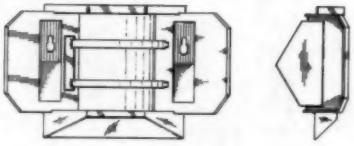
287,859
ELECTROPHOTOGRAPHIC COPYING MACHINE
Masanori Hashimoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jun. 26, 1984, Ser. No. 624,582
Claims priority, application Japan, Dec. 26, 1983, 58-056764
Term of patent 14 years
U.S. Cl. D16—31



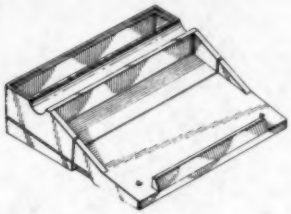
287,860
PEN
Susan McShirley, 4216½ Glencoe Ave., Marina del Rey, Calif. 90292
Filed Nov. 26, 1984, Ser. No. 674,980
Term of patent 14 years
U.S. Cl. D19—42



287,861
FLIP CARD FILE HOLDER
Calvin G. Husbands, 7237 SW. Canyon Dr., Portland, Oreg. 97225
Filed Mar. 30, 1984, Ser. No. 595,048
Term of patent 14 years
U.S. Cl. D19—76

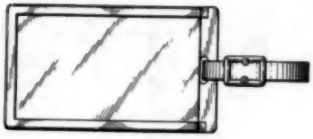


287,862
DESK TRAY
Mark W. Hauser, Hudson, Wis., and David C. Windorski, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 1, 1984, Ser. No. 636,726
Term of patent 14 years
U.S. Cl. D19—78

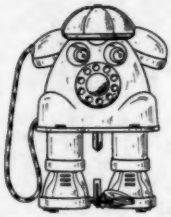


287,863
VENDING MACHINE FOR BEVERAGES OR THE LIKE
Louis A. Cedrone, Eastchester, and Bruce J. Vahjen, Yorktown Heights, both of N.Y., assignors to PepsiCo, Inc., Purchase, N.Y.
Filed Nov. 3, 1983, Ser. No. 548,509
Term of patent 14 years
U.S. Cl. D20—5

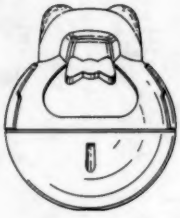
287,864
IDENTIFICATION CARDHOLDER
Alan J. Perfect, Crosswicks, N.J., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed Apr. 6, 1984, Ser. No. 598,180
Term of patent 14 years
U.S. Cl. D20—27



287,865
TELEPHONE FIGURE PULL TOY
Mario Colnaghi, Cisliano, Italy, assignor to Eurostil, S.r.l., Arluno, Italy
Filed May 30, 1984, Ser. No. 615,120
Term of patent 14 years
U.S. Cl. D21—111



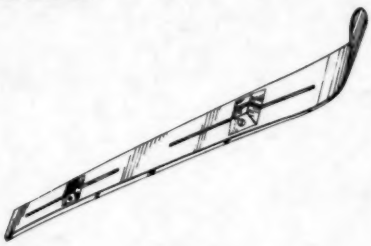
287,866
ACTION TOY
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Couldson, England
Filed Feb. 19, 1985, Ser. No. 702,485
Claims priority, application United Kingdom, Jan. 14, 1985, 1024388
Term of patent 14 years
U.S. Cl. D21—150



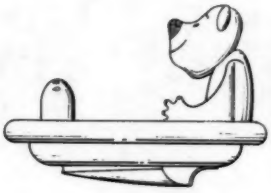
287,867
BAR EXERCISER
Larry D. Wollersheim, Aspen, Colo., assignor to Charles of the Ritz Group Ltd., New York, N.Y.
Filed Apr. 6, 1984, Ser. No. 597,703
Term of patent 14 years
U.S. Cl. D21—198

287,868
SPORTING GAME ARTICLE
Milton H. Whaley, 2000 Bidwell Way, Sacramento, Calif. 95818
Filed Jun. 11, 1984, Ser. No. 619,670
Term of patent 14 years
U.S. Cl. D21—198

287,869
SKI
Andrej Robic, Radovljica, Yugoslavia, assignor to Flan Tovarna Sportnega Orodja n.sol.o., Begunje na Gorenjskem, Yugoslavia
Filed Aug. 8, 1984, Ser. No. 638,687
Term of patent 14 years
U.S. Cl. D21—229

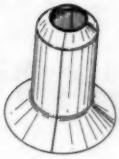


287,870
INFANT'S SWIMMING POOL FLOAT
Henry S. Wolfe, P.O. Box 6025, Clearwater, Fla. 33518
Filed Dec. 12, 1984, Ser. No. 680,973
Term of patent 14 years
U.S. Cl. D21—237



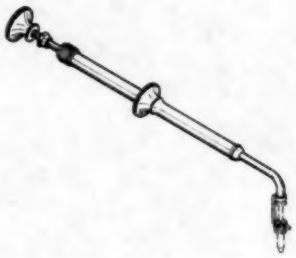
287,871
SEISMIC GAS SHUT-OFF VALVE
David E. Ritchie, 6166 Palo Alto Dr., Anaheim Hills, Calif. 92807, and Edward E. Seay, 881 Nordica, Anaheim, Calif. 92806
Filed Apr. 2, 1984, Ser. No. 595,693
Term of patent 14 years
U.S. Cl. D23—19

287,872
SEALING DEVICE FOR SURROUNDING THE POINT OF EMERGENCE OF A PIPE FROM A WALL OR FLOOR
Stellan Eriksson, Sollebrunn, Sweden, assignor to Indoor Innovation Aktiebolag, Ladvika, Sweden
Filed Dec. 2, 1983, Ser. No. 557,526
Term of patent 14 years
U.S. Cl. D23—40



287,873
POLLUTANT COLLECTOR FOR CLEANING AIR RISING FROM KEROSENE HEATER
Nathan J. Gillotti, Danbury, Conn., assignor to Spinair Corporation, Danbury, Conn.
Filed Jan. 20, 1984, Ser. No. 572,473
Term of patent 14 years
U.S. Cl. D23—127

287,874
COMBINED HOLDER AND DISPENSER FOR DENTAL COMPOSITE MATERIAL CARTRIDGE
William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton, and Robert D. Holewinski, Lakehurst, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Dec. 3, 1984, Ser. No. 677,428
Term of patent 14 years
U.S. Cl. D24—10



287,875
COMBINED HOLDER AND DISPENSER FOR DENTAL COMPOSITE MATERIAL CARTRIDGE
William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton, and Robert D. Holewinski, Lakehurst, all of N.J., assignors to Johnson & Johnson Dental Company, East Windsor, N.J.
Filed Dec. 3, 1984, Ser. No. 677,646
Term of patent 14 years
U.S. Cl. D24—10

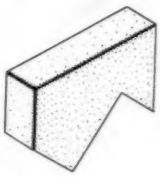
287,876
SINGLE DOSE CARTRIDGE FOR DENTAL COMPOSITE MATERIAL
William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton, and Robert D. Holewinski, Lakehurst, all of N.J., assignors to Johnson & Johnson Dental Company, East Windsor, N.J.
Filed Dec. 3, 1984, Ser. No. 677,653
Term of patent 14 years
U.S. Cl. D24—10

287,877
DENTAL SYRINGE
Robert D. Holewinski, Lakehurst; Edward A. Weissenburger, Mercerville, and William J. Blatherwick, Hamilton Square, all of N.J., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.
Filed Jul. 20, 1984, Ser. No. 632,971
Term of patent 14 years
U.S. Cl. D24—14

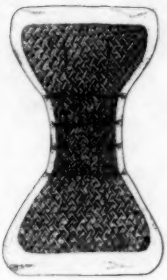
287,878
SPHYGMOMANOMETER UNIT FOR BLOOD PRESSURE MEASURING SYSTEMS
Donald H. Peeler, Pittsford, N.Y., assignor to Nalge Company, Saddle Brook, N.J.
Filed Feb. 9, 1983, Ser. No. 465,287
Term of patent 14 years
U.S. Cl. D24—21

287,879
ELECTROSURGICAL HANDLE
Charles R. Braxton, Boulder; Alan Z. Puszman, Lyons, and William A. Johnk, Boulder, all of Colo., assignors to Valleylab, Inc., Boulder, Colo.
Filed Sep. 10, 1984, Ser. No. 649,242
Term of patent 14 years
U.S. Cl. D24—30

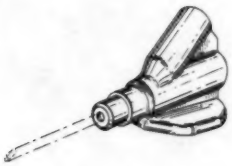
287,880
NOSE TAMPON
Donald E. Doyle, 9201 Sunset Blvd., Ste. 611, Los Angeles, Calif. 90069
Filed Feb. 23, 1984, Ser. No. 582,962
Term of patent 14 years
U.S. Cl. D24—51



287,881
INCONTINENCE PAD
Maj I. Ternström, Mölnlycke, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Oct. 16, 1984, Ser. No. 663,044
Claims priority, application Sweden, Apr. 18, 1984, 84-1285
Term of patent 14 years
U.S. Cl. D24—51



287,882
NEEDLE HUB
Dean M. Glash, McHenry; Robert J. Kruger, Arlington Heights; Steven L. Olson, McHenry, all of Ill., and Richard L. West, Salem, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 15, 1983, Ser. No. 485,544
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—61

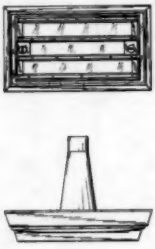


287,883
STORE FRONT
Afra Bianchi Scarpa, and Tobia Scarpa, both of Trevignano, Italy, assignors to Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S., Treviso, Italy
Division of Ser. No. 537,792, Sep. 20, 1983. This application Jun. 13, 1985, Ser. No. 744,519
Claims priority, application Italy, Apr. 1, 1983, 21345/83[U]
Term of patent 14 years
U.S. Cl. D25—9

287,884
PAVING STONE
Rolf Scheiwiller, Lindeneggweg 10, CH-3645 Gwatt, Switzerland
Filed Jul. 1, 1983, Ser. No. 510,219
Claims priority, application Switzerland, Jan. 4, 1983, DMA/066170
Term of patent 14 years
U.S. Cl. D25—80

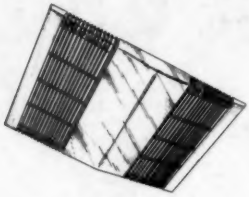
287,885
HURRICANE LAMP
Pierre-Yves Bolduc, 8420 Melrose Pl., Los Angeles, Calif. 90069
Filed Sep. 26, 1983, Ser. No. 535,720
Term of patent 14 years
U.S. Cl. D26—11

287,886
MOTORCYCLE LIGHT
Gordon E. McMahon, 7400 NW. 31st, Bethany, Okla. 73008
Continuation-in-part of Ser. No. 501,178, Jun. 6, 1983. This application Jul. 30, 1984, Ser. No. 635,850
Term of patent 14 years
U.S. Cl. D26—28



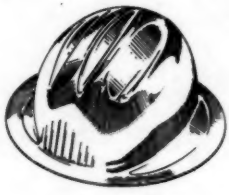
287,887
BICYCLE HEAD LIGHT
Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan
Filed Apr. 20, 1984, Ser. No. 602,618
Claims priority, application Japan, Nov. 14, 1983, 58-49534
Term of patent 14 years
U.S. Cl. D26—29

287,888
COMBINATION CEILING LIGHT AND VENT GRILLE
Dennis B. Castor, Cincinnati, and John W. Harper, Hamilton, both of Ohio, assignors to NuTone Inc., Cincinnati, Ohio
Filed Feb. 23, 1984, Ser. No. 582,943
Term of patent 14 years
U.S. Cl. D26—59

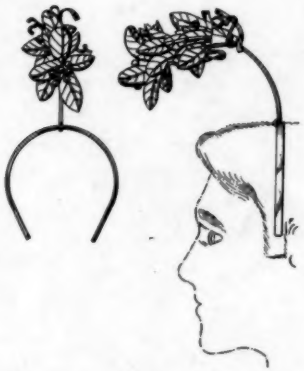


287,889
COLLAPSIBLE LAMPSHADE
Paul Goldstein, 5810 Cowen Pl. NE., Seattle, Wash. 98105
Filed Sep. 6, 1984, Ser. No. 648,120
Term of patent 14 years
U.S. Cl. D26—118

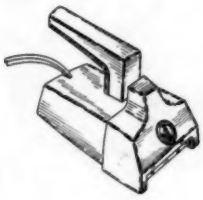
287,890
LUMINAIRE REFLECTOR
Hendrik A. J. De Vos, Swansea, Mass., assignor to GTE Products Corporation, Stamford, Conn.
Filed Nov. 7, 1984, Ser. No. 669,274
Term of patent 14 years
U.S. Cl. D26—118



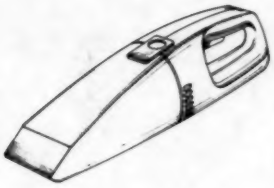
287,891
HEAD ORNAMENT
Mario P. Cavaliere, 9219 W. Cermak Rd., North Riverside, Ill. 60546
Filed May 1, 1984, Ser. No. 605,946
Term of patent 14 years
U.S. Cl. D28—41



287,892
GARMENT STEAMER
Richard L. Rosa, Sebastopol, and Edward H. Gauer, Jr., Geyserville, both of Calif., assignors to Hybrinetics, Inc., Santa Rosa, Calif.
Filed Apr. 25, 1984, Ser. No. 603,620
Term of patent 14 years
U.S. Cl. D32—17



287,893
PORTABLE VACUUM CLEANER
Ichiro Fujii; Hiroshi Yajima, both of Osaka, and Toyomi Arita, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed May 15, 1984, Ser. No. 610,403
Claims priority, application Japan, Nov. 18, 1983, 58-50403
Term of patent 14 years
U.S. Cl. D32—21



287,894
CARPET CLEANER
Donald E. Watkins, Parma, Ohio, and Frank P. Aadahl, Bound Brook, N.J., assignors to Regina Co. Inc., Rahway, N.J.
Filed Mar. 2, 1984, Ser. No. 585,729
The portion of the term of this patent subsequent to Jan. 27, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—22

287,895

MOTOR HOUSING FOR CANISTER TYPE ELECTRIC VACUUM CLEANER

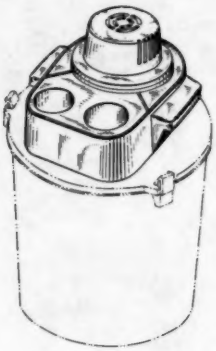
Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Robert L. Crevling, Jr., Williamsport, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

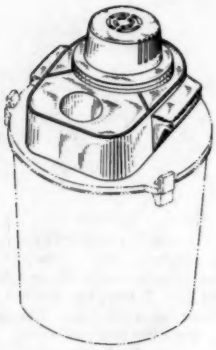
Filed Jan. 18, 1984, Ser. No. 571,848

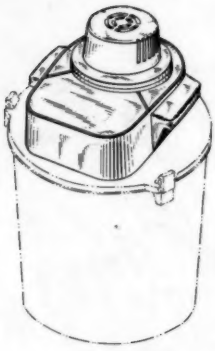
The portion of the term of this patent subsequent to Jan. 6, 2001, has been disclaimed.

Term of patent 14 years

U.S. Cl. D32—25







287,896

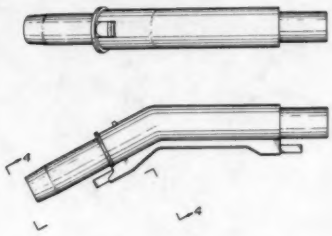
VACUUM CLEANER HOSE ADAPTER

Joseph Genoa, Freeport; Harold Kaskel, Long Beach, both of N.Y., and Carl Nelson, Wyckoff, N.J., assignors to Atlantic Vacuum Parts Corp., Long Beach, N.Y.

Filed Sep. 7, 1984, Ser. No. 648,642

Term of patent 14 years

U.S. Cl. D32—32



287,897

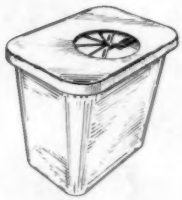
NEEDLE/SYRINGE COLLECTION CONTAINER

Paul H. Hanifl, Barrington, Ill., assignor to Sage Products, Inc., Cary, Ill.

Filed Aug. 17, 1984, Ser. No. 642,041

Term of patent 14 years

U.S. Cl. D34—1



287,898

DOOR CONTROLLED FLAG FOR MAILBOX

Henry P. Carter, 412 S. Broadway, Grove, Okla. 74344

Continuation-in-part of Ser. No. 541,885, Oct. 14, 1983. This application Mar. 7, 1985, Ser. No. 709,829

Term of patent 14 years

U.S. Cl. D99—29

287,899

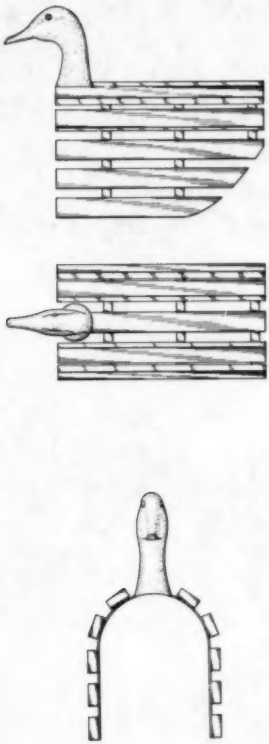
MAILBOX COVER

Thom Lindheimer, Rte. 1, P.O. Box 240, Castle Hayne, N.C. 28429

Filed Apr. 20, 1984, Ser. No. 602,283

Term of patent 14 years

U.S. Cl. D99—30



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. G. Busch & Co., Inc.: *See*—
Carr, Francis L.; and Terrill, Larry R., 4,638,236, Cl. 320-21.000.

A/S Ingeniorgruppen AF: *See*—
Edberg, Dan O., 4,637,561, Cl. 241-154.000.

Aagaard, Paul M., to Chevron Research Company. Barbed anchor pile. 4,637,757, Cl. 405-227.000.

Aas, Ants J.: *See*—
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.

AB A. K. Eriksson: *See*—
Jansson, Kurt, 4,637,443, Cl. 144-39.000.

AB Bahco Ventilation: *See*—
Enberg, Helge, 4,637,302, Cl. 98-115.300.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, 4,638,376, Cl. 358-342.000.

Abe, Shinichi; and Mizuno, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Method for controlling air-fuel ratio for internal combustion engine and apparatus therefor. 4,637,364, Cl. 123-492.000.

Abe, Shuichi: *See*—
Watabe, Masaya; and Abe, Shuichi, 4,638,429, Cl. 364-200.000.

Abe, Wataru: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Abex Corporation: *See*—
Frank, Earl E., 4,637,578, Cl. 246-391.000.

ABG Semca: *See*—
Decima, Fredy, 4,637,472, Cl. 169-35.000.

Abo, Mituyosi: *See*—
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Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., to American Home Products Corporation. Antiarrhythmic agents. 4,638,008, Cl. 514-411.000.

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Acampora, Anthony; and Gans, Michael J., to AT&T Bell Laboratories. Technique for dynamic resource allocation in a communication system. 4,638,476, Cl. 370-83.000.

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Whitney, David R.; and Whitney, Ronald B., 4,637,797, Cl. 434-118.000.

Acker, Franklin L., to Neway Manufacturing, Inc. Hand-operated valve refacer. 4,637,762, Cl. 408-203.500.

Acock, George W., Jr., to Rhodes, James A. Elevator air lock. 4,637,176, Cl. 52-30.000.

Adachi, Shigeo: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Adams, Philip E.; McGowan, Michael J.; and Yunan, Malak E., to Du Pont de Nemours, E. I., and Company. Explosive primer and carrier therefor. 4,637,312, Cl. 102-275.120.

ADB-Alnaco, Inc.: *See*—
Trainor, Willis H., 4,638,411, Cl. 362-145.000.

Adelman, Roger A. Method for quantitatively measuring a hearing defect. 4,637,402, Cl. 128-746.000.

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Miller, Michael J., 4,638,300, Cl. 340-347.0DD.

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Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,637,640, Cl. 285-319.000.

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Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,637,395, Cl. 128-334.00R.

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Lobell, Hans; Svensson, Kias G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.

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Fukuda, Tsuguo; and Terashima, Kazutaka, 4,637,854, Cl. 156-607.000.
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Agfa-Gevaert AG: *See*—
Hofmann, Wilfried, 4,638,336, Cl. 346-140.00R.

Aguet, Emile, to Sulzer Brothers Limited. Combined hot air turbine and steam power plant. 4,637,212, Cl. 60-655.000.

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Aichi Steel Works, Ltd.: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.

Air Products and Chemicals, Inc.: *See*—
Shenoy, Thirthahalli A.; and Winters, Arthur R., Jr., 4,637,216, Cl. 62-54.000.

Aisin Seiki Kabushikikaisha: *See*—
Umebayashi, Kazuyuki; and Yamada, Takahiro, 4,638,287, Cl. 340-22.000.

Aiura, Hirochika: *See*—
Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, 4,637,720, Cl. 356-125.000.

Aizaki, Yoshihiko, to Fujitsu Limited. Cash processing system. 4,638,434, Cl. 364-401.000.

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Akerlund, Mats P.; and Stromback, Ture J., to U.S. Philips Corporation. Stray pulse eliminating device. 4,638,301, Cl. 340-347.0CC.

Akers, Alvin: *See*—
McMillan, Stephen L.; Akers, Alvin; and Toma, Daniel N., 4,637,231, Cl. 68-4.000.

Akita, Shigeyuki: *See*—
Tanaka, Hiroaki; and Akita, Shigeyuki, 4,638,249, Cl. 324-166.000.

Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, to Kabushiki Kaisha Komatsu Seisakusho. Torque regulating system for fluid operated pump displacement control systems. 4,637,781, Cl. 417-216.000.

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Svensson, Leif; Nyqvist, Jan-Olof; and Westling, Lars, 4,638,065, Cl. 544-196.000.

Aktiebolaget Hassle: *See*—
Szelke, Michael; and Jones, David M., 4,638,047, Cl. 530-332.000.

Akutsu, Mitsuru, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic head pressure pad device. 4,638,392, Cl. 360-130.320.

Albert, Richard: *See*—
Haim, Elias S.; and Albert, Richard, 4,637,687, Cl. 350-335.000.

Alberta Energy Company Ltd.: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Albrecht, Joachim; and Duerig, Thomas, to BBC Brown Boveri & Company Limited. Composite material in rod, tube, strip, sheet or plate shape with reversible thermomechanical properties and process for its production. 4,637,962, Cl. 428-616.000.

Albrecht, Konrad: *See*—
Heinrich, Rudolf; and Albrecht, Konrad, 4,638,090, Cl. 564-437.000.

Alcan International Limited: *See*—
Jeffrey, Paul W.; and Marchand, Gilles, 4,637,842, Cl. 148-12.70A.

Alcombright, Daniel S.: *See*—
Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.

Aldridge, Clyde L.: *See*—
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,870, Cl. 208-112.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,871, Cl. 208-112.000.

Aleman, Javier. Carrying strap for cameras and the like. 4,637,535, Cl. 224-202.000.

Alexander, Jonathan W., to Tocco, Inc. Power inverter. 4,638,418, Cl. 363-49.000.

Alexander, Kenneth L., to Omark Industries, Inc. Combination ammunition reloading die. 4,637,291, Cl. 86-23.000.

Alexis, Roger P. J., to U.S. Philips Corporation. Method of two-way radiocommunication between fixed stations and mobile stations. 4,638,479, Cl. 370-95.000.

Alfred Bolz GmbH & Co. KG: *See*—
Boos, Gunther, 4,637,760, Cl. 406-105.000.

Algeo, John W.: *See*—
Johnson, Richard K.; and Algeo, John W., 4,637,818, Cl. 604-89.000.

Algoma Hardwoods, Inc.: *See*—
Ellsworth, Wendell E.; and Birdsall, Raymond P., 4,637,182, Cl. 52-211.000.

All-Steel Canada Ltd.: *See*—
Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., 4,637,666, Cl. 312-196.000.

Allen-Bradley Company: *See*—
Simonsen, Glenn H.; and Klotz, Clayton J., 4,637,676, Cl. 339-113.00R.

Allen-Bradley Company, Inc.: *See*—
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., 4,638,452, Cl. 364-900.000.

Allen, Thomas P. Multi-purpose collapsible hand saw. 4,637,141, Cl. 30-512.000.

Alley, Lewis F.: *See*—
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Allied Corporation: *See*—
Boggs, Beryl A., 4,637,286, Cl. 83-175.000.
Brown, G. Emerson, 4,637,662, Cl. 303-6.00R.
Carp, Ralph W., 4,637,251, Cl. 73-118.200.
Krull, Ulrich J.; and Thompson, Michael, 4,637,861, Cl. 204-1.00T.
Lewis, Richard J., 4,637,596, Cl. 267-160.000.
Yeh, Lun-Shu R.; Grenness, Morten; and Fuller, Robert J., 4,637,970, Cl. 429-153.000.

Almblad, Donald F. Key and retainer card combination. 4,637,236, Cl. 70-458.000.

Alps Electric Co., Ltd.: *See*—
Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, 4,638,391, Cl. 360-125.000.
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,638,387, Cl. 360-122.000.
Ueno, Moriaki, 4,638,264, Cl. 331-117.00D.

Alsthom: *See*—
Obrecht, Georges; and Dreuilhe, Claude, 4,637,480, Cl. 175-45.000.

Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, to Siemens Aktiengesellschaft. Circuit arrangement for a small PABX with a switching matrix that has electronic crosspoints. 4,638,123, Cl. 379-229.000.

Althaus, Hans-Ludwig; Klann, Jorg; and Kuny, Wilhelm, to Siemens Aktiengesellschaft. Optical radiation source or detector device having plural radiating or receiving characteristics. 4,638,343, Cl. 357-17.000.

Alvi, Javid R. Test tube protector. 4,637,520, Cl. 215-320.000.

AMA Universal S.p.A.: *See*—
Zucchini, Guido, 4,637,232, Cl. 68-18.00R.

Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, to Hitachi, Ltd. Gas-insulated switchgear apparatus. 4,638,403, Cl. 361-341.000.

Amchem Products, Inc.: *See*—
Hall, Wilbur S., 4,637,839, Cl. 148-6.200.

American Can Company: *See*—
Karas, Richard J.; and LaRosa, John, 4,637,117, Cl. 29-527.400.

American Cyanamid Company: *See*—
Los, Marinus, 4,638,068, Cl. 546-169.000.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,637,409, Cl. 131-336.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,638,008, Cl. 514-411.000.

American Motors Corporation: *See*—
Wu, Leonard L., 4,637,091, Cl. 15-250.340.

American Science and Engineering, Inc.: *See*—
Keller, Franz, 4,638,314, Cl. 340-870.020.

Amerock Corporation: *See*—
Boda, John W., 4,637,582, Cl. 248-315.000.

Ametek, Inc.: *See*—
Kalagidis, Memorial, 4,638,197, Cl. 310-67.00R.

Amoco Corporation: *See*—
Forgac, John M.; and Hoekstra, George R., 4,637,464, Cl. 166-261.000.
Kelsey, Donald R., 4,638,044, Cl. 528-125.000.
Mossman, Allen B., 4,638,098, Cl. 568-630.000.

AMP Incorporated: *See*—
Barkus, Lee A., 4,637,677, Cl. 339-274.000.
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., 4,637,670, Cl. 339-46.000.
Grabbe, Dimitry G., 4,637,135, Cl. 29-832.000.
Kobler, Robert J., 4,637,674, Cl. 339-94.00M.
Loose, Winfield W., 4,637,675, Cl. 339-97.00R.

Ampex Corporation: *See*—
Lee, Patrick S., 4,638,230, Cl. 318-632.000.

Amsted Industries Incorporated: *See*—
Moehling, Charles; and Henkel, James A., 4,637,319, Cl. 105-207.000.

Amtel, Inc.: *See*—
Pollack, Jack, 4,637,335, Cl. 114-230.000.

Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., to SRI International. Slip sensing method and apparatus. 4,637,736, Cl. 374-45.000.

Andeen, Gerry B., to SRI International. Fluid motor-pumping apparatus and method for energy recovery. 4,637,783, Cl. 417-318.000.

Anderson, James E.: *See*—
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Anderson, Paul J.: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., 4,637,403, Cl. 128-770.000.

Anderson Strathclyde PLC: *See*—
Tomlinson, James E., 4,637,510, Cl. 198-735.000.

Ando, Takao: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Ando, Toshiharu; and Tsuchihashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Epoxy resin composition. 4,638,021, Cl. 523-457.000.

Anelva Corporation: *See*—
Asamaki, Tatsuo; and Kato, Takao, 4,638,209, Cl. 313-359.100.

Anmin Manufacturing Co., Ltd.: *See*—
Maekawa, Taijiro; and Fujino, Yukio, 4,637,947, Cl. 428-68.000.

Anneken, James G. Means of isolating automobile blower intake from engine compartment and exhaust fumes. 4,637,297, Cl. 98-2.000.

Annipajo, Wolfgang; Breuer, Oswald; and Rassmann, Christoph. Cutters for use in mineral mining. 4,637,658, Cl. 299-79.000.

Anritsu Electric Company Limited: *See*—
Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, 4,637,508, Cl. 198-365.000.

Ansteth, John J. Filter head for spin-off filters. 4,637,874, Cl. 210-232.000.

Anstey, Michael J.: *See*—
Brown, David F.; and Anstey, Michael J., 4,638,348, Cl. 357-74.000.

Anthony Manufacturing Corp.: *See*—
Ray, Charles A.; and Walker, Samuel C., 4,637,548, Cl. 239-201.000.

Aoki, Masayuki, to Kabushiki Kaisha Toshiba. Induction heat cooking apparatus. 4,638,135, Cl. 219-10.49R.

Aoki, Nobuo; and Kurosawa, Shinichiro, to Kowa Co., Ltd. Thrombin-binding substance and process for its production. 4,638,050, Cl. 530-413.000.

Aoki, Shinichiro: *See*—
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, 4,637,256, Cl. 73-633.000.

Aoyama, Shigetsune: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.

Apache Powder Company: *See*—
Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., 4,637,848, Cl. 149-21.000.

Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,637,093, Cl. 16-35.00R.

Arai, Nobushige, to Sharp Kabushiki Kaisha. Selective absorption film of a solar heat collector. 4,637,374, Cl. 126-417.000.

Arai, Shoji; Tamano, Yutaka; and Hasegawa, Masazumi, to Toya Soda Manufacturing Co., Ltd. Process for producing high density elastic polyurethane using a combination of 4-methyl-1-(2-dimethylaminoethyl) piperazine together with another tertiary amine catalyst. 4,638,016, Cl. 521-129.000.

Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., to AT&T Bell Laboratories. Relay switch apparatus. 4,638,274, Cl. 335-52.000.

Archibald, G. Kent; and Slaker, Frank A., to Minnesota Mining & Manufacturing Company. Sequence valve for piggyback IV administration with occlusion failure sensing. 4,637,817, Cl. 604-81.000.

Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, to Daihen Corporation. Toroidal winding apparatus. 4,637,563, Cl. 242-4.00B.

Arikawa, Tetsuro, to Nippon A B S, Ltd. Anti-skid control apparatus for a vehicle braking system. 4,637,664, Cl. 303-111.000.

Arima, Hideo: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Arisaka, Kouhei: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.

Arkansas Patents, Inc.: *See*—
Davis, Robert E., 4,637,792, Cl. 431-1.000.

Armand, Michel: *See*—
Skotheim, Terje; and Armand, Michel, 4,637,969, Cl. 429-111.000.

Armstrong, Michael J.: *See*—
Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., 4,637,666, Cl. 312-196.000.

Armstrong World Industries, Inc.: *See*—
Shannon, Paul J., 4,637,896, Cl. 252-299.700.

Arnold, Marc E.; and Marcus, Mitchell S., to Hasco International, Inc. System for package photoprinting. 4,637,712, Cl. 355-75.000.

Arora, Sudershan K.: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.

Arrigoni, Giordano. Apparatus for dispensing pigments. 4,637,527, Cl. 222-144.000.

Aruga, Masayoshi: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.

Asai, Toshio; and Nakaya, Yasuhiro, to Fukuda Denshi Co., Ltd. Waterproof electrode for recording electrocardiogram. 4,637,399, Cl. 128-639.000.

Asakawa, Kenichi: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.

Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, to Chisso Corporation; and Nissan Motor Co. Ltd. Polypropylene interior parts for autocars. 4,638,030, Cl. 524-536.000.

Asamaki, Tatsuo; and Kato, Takao, to Anelva Corporation. Ion beam generating apparatus. 4,638,209, Cl. 313-359.100.

Asano, Hideo: *See*—
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, to Kabushiki Kaisha Kobe Seiko Sho. Method for shaping aluminum wheel. 4,637,112, Cl. 29-159.010.
Asawa, Charles K., to TRW Inc. Method for aligning optical fiber connectors. 4,637,683, Cl. 350-96.180.
Ashahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, 4,637,720, Cl. 356-125.000.
Ashihara, Hiromoto: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.
Aso, Toshiyuki: *See*—
Obara, Haruki; and Aso, Toshiyuki, 4,638,140, Cl. 219-69.00W.
Assadoullah, Assad: *See*—
Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, 4,637,733, Cl. 368-120.000.
Astner, Gunnar: *See*—
Thornblom, Jan; and Astner, Gunnar, 4,638,489, Cl. 373-24.000.
AT&T Bell Laboratories: *See*—
Acampora, Anthony; and Gans, Michael J., 4,638,476, Cl. 370-83.000.
Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., 4,638,274, Cl. 335-52.000.
Bowers, John E., 4,638,483, Cl. 372-26.000.
Derkits, Gustav E., Jr.; and Harbison, James P., 4,637,129, Cl. 29-578.000.
Gordon, Eugene I., 4,637,685, Cl. 350-96.200.
Saari, Veikko R., 4,638,259, Cl. 330-253.000.
AT&T Technologies, Inc.: *See*—
Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., 4,637,989, Cl. 501-135.000.
Ling, Hung C.; and Yan, Man F., 4,638,401, Cl. 361-321.000.
Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme: *See*—
Dufrasnes, Jean-Claude, 4,638,127, Cl. 200-11.00K.
Atkey, Richard E.; and Gilliland, Oscar E., to Dover Corporation. Elevator rail system. 4,637,496, Cl. 187-95.000.
Atlantic Research Corporation: *See*—
Nieder, Erin G., 4,637,847, Cl. 149-6.000.
Atlantic Richfield Company: *See*—
Beatty, Ronald L.; and Wyman, Floyd H., 4,637,924, Cl. 423-345.000.
Gay, Robert R., 4,638,111, Cl. 136-249.000.
Pominville, Douglas A., 4,637,824, Cl. 55-85.000.
Attenborough, Frank R.: *See*—
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.
Auch, Wilfried; and Schlemper, Eberhard, to International Standard Electric Corporation. Acoustooptical modulator and/or deflector. 4,638,266, Cl. 332-7.510.
Audi NSU Auto Union Aktiengesellschaft: *See*—
Bier, Axel, 4,638,174, Cl. 307-10.0LS.
Auerbach, Jeffrey I.; and Rosenberg, Martin, to SmithKline Beckman Corporation. Externalization of products of bacteria. 4,637,980, Cl. 435-68.000.
Austin, Theodore D.; and Consaga, John P., to United States of America, Navy. Radar reflecting electrolytes. 4,638,316, Cl. 342-14.000.
Automated Industrial Systems: *See*—
Latta, William A., Jr., 4,638,144, Cl. 219-121.0LH.
Automobiles Citroen: *See*—
Gillet, Guy, 4,637,741, Cl. 384-428.000.
Automobiles Peugeot: *See*—
Gillet, Guy, 4,637,741, Cl. 384-428.000.
Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, to BASF Aktiengesellschaft. Fiber-optical Doppler anemometer. 4,637,716, Cl. 356-28.500.
Avco Corporation: *See*—
Henderson, David; Hollowell, James A.; and Woodbury, Howard A., 4,637,313, Cl. 102-398.000.
Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, to Kabushiki Kaisha Kobe Seiko Sho. Method for the continuous production of cast steel strands. 4,637,453, Cl. 164-468.000.
Ayliffe, Peter J., to International Standard Electric Company. Method of addressing liquid crystal displays. 4,638,310, Cl. 340-805.000.
B. F. Goodrich Company, The: *See*—
Percec, Virgil, 4,638,039, Cl. 525-534.000.
Baartman, John L., III: *See*—
Steck, Robert F.; and Baartman, John L., III, 4,637,199, Cl. 53-451.000.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Fukayama, Yukio, 4,637,348, Cl. 122-406.0ST.
Babitz, Jeffrey M. Device for positioning picture hangers on a wall surface. 4,637,583, Cl. 248-544.000.
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., to Dayton Reliable Tool & Mfg. Co. Shell for can ends. 4,637,961, Cl. 428-579.000.
Backstrom, Hans. Rotary pump with cutter device for contaminated fluids. 4,637,785, Cl. 418-48.000.
Badaracco, John A.; and Martin, Henry A. Tape cleaning machine. 4,637,088, Cl. 15-97.00R.
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., to Labthermics Technologies, Inc. Temperature control and analysis system for hyperthermia treatment. 4,638,436, Cl. 364-414.000.
Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, to Officine Savio SpA. Splicer device for the mechanical splicing of textile yarns. 4,637,205, Cl. 57-22.000.
Baer, Robert J., to RJB and C Company. Combined book and mirror. 4,637,631, Cl. 281-15.00R.
Baermann, Horst, to Max Baermann, G.m.b.H. Magnetic roll for copy machines and method for manufacturing same. 4,638,281, Cl. 335-303.000.
Baertsch, Richard D.: *See*—
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., to Honeywell Inc. Gated transmission line model structure for characterization of field-effect transistors. 4,638,341, Cl. 357-15.000.
Baitz, Guenter; and Dobring, Wilfried, to Nixdorf Computer AG. Money box arrangement. 4,637,326, Cl. 109-49.000.
Baker, Kenneth R. Universal adjustable weld gauge. 4,637,142, Cl. 33-169.00D.
Baker, Stephen J.: *See*—
Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., 4,638,442, Cl. 364-489.000.
Balkus, Carl E. Gravel washer separator. 4,637,872, Cl. 209-453.000.
Ballard, Danny B., to Motorola, Inc. Emulating computer. 4,638,423, Cl. 364-200.000.
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, to Societe d'Optique, Precision Electronique et Mecanique-Sopelem. Observation apparatus. 4,637,692, Cl. 350-486.000.
Banfield, Charles E., to Epoxy Technology, Inc. Method and compositions for removal of moisture. 4,637,197, Cl. 53-428.000.
Banno, Makoto: *See*—
Miyamae, Hiroshi; and Banno, Makoto, 4,637,690, Cl. 350-427.000.
Barbosa, Antonio B.; and de Campos, Joaquim C. Radiator bracket. 4,637,517, Cl. 211-86.000.
Barcus-Berry Electronics, Inc.: *See*—
Crooks, Robert C., 4,638,258, Cl. 330-149.000.
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., to Ceramic Cooling Tower Company. Lightweight cooling tower. 4,637,903, Cl. 261-24.000.
Barker, Randall R. Diving helmet. 4,638,410, Cl. 362-105.000.
Barkley, Vincent. Alignment compensator for linear bearings. 4,637,738, Cl. 384-38.000.
Barkus, Lee A., to AMP Incorporated. Electrical connector. 4,637,677, Cl. 339-274.000.
Barlow, Dane D. Electroluminescent badge. 4,637,148, Cl. 40-1.500.
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., to General Foods Corporation. Cycloalkyl ethers and thioethers of dipeptides. 4,638,071, Cl. 549-88.000.
Baro, Gunter: *See*—
Scharpenberg, Rainer; and Baro, Gunter, 4,637,912, Cl. 376-245.000.
Bartch, Donald W.: *See*—
Deal, Samuel B.; and Bartch, Donald W., 4,638,213, Cl. 313-479.000.
Bartel, Peter: *See*—
Kleefeldt, Frank; and Bartel, Peter, 4,637,239, Cl. 70-264.000.
Barth, Rudiger, to Licentia Patent-Verwaltungs-GmbH. Control panel for a tape recorder. 4,638,389, Cl. 360-72.100.
Bartimes, George F.; and Blomquist, Leonard A., to Continental Plastic Containers, Inc. Label separator. 4,637,600, Cl. 271-93.000.
Barton, Scott N.: *See*—
Quinn, Bruce A.; and Barton, Scott N., 4,638,312, Cl. 340-825.350.
Barwasser, Gunther: *See*—
Kotting, Fritz; and Barwasser, Gunther, 4,637,168, Cl. 51-50.0PC.
BASF Aktiengesellschaft: *See*—
Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, 4,637,716, Cl. 356-28.500.
Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, 4,638,055, Cl. 534-678.000.
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.
Mueller, Herbert, 4,638,097, Cl. 568-617.000.
BASF Corporation: *See*—
Niu, Joseph H. Y.; and Schmolka, Irving R., 4,637,822, Cl. 44-51.000.
Reichel, Curtis J.; Levis, William W., Jr.; and Hartman, Robert J., 4,637,893, Cl. 252-182.000.
Basyouni, Mohamed: *See*—
Froening, Helmut; and Basyouni, Mohamed, 4,637,175, Cl. 52-27.000.
Battelle Corporation: *See*—
Gardner, David L., 4,637,905, Cl. 264-4.300.
Battiste, David R.; and Harris, Jesse R., to Phillips Petroleum Company. Pillared interlayered clays. 4,637,991, Cl. 502-68.000.
Baudro, Thomas O., to Proto-Power Corporation. Radiation shield. 4,638,166, Cl. 250-515.100.
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Acrylic telomers with grafts which can be cross linked by light, their synthesis and their applications in coating metals. 4,638,018, Cl. 522-103.000.

Bauer, Bernhard: *See*—
Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, 4,637,740, Cl. 384-425.000.
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,637,806, Cl. 464-130.000.

Bauer, Peter: *See*—
Petermann, Harald; and Bauer, Peter, 4,637,369, Cl. 125-15.000.

Baum, Allen J.: *See*—
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, 4,637,346, Cl. 122-4.00A.

Baum, Marcel, to Dragerwerk AG. Ventilation system having true valve control for controlling ventilation pressures. 4,637,386, Cl. 128-204.210.

Baumgartner, Richard A.; Dukes, John N.; and Fisher, George A., to Hewlett-Packard Company. Amplitude insensitive delay line. 4,638,191, Cl. 307-602.000.

Baxter Travenol Laboratories, Inc.: *See*—
DeVries, James H., 4,637,813, Cl. 604-6.000.
White, Leonard A., 4,637,934, Cl. 426-117.000.

Bayer Aktiengesellschaft: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.
Herd, Karl J.; and Michna, Martin, 4,638,054, Cl. 534-637.000.
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, 4,638,004, Cl. 514-272.000.

BBC Brown Boveri & Company Limited: *See*—
Albrecht, Joachim; and Duerig, Thomas, 4,637,962, Cl. 428-616.000.
Brem, Ernst; and Merki, Josef, 4,638,199, Cl. 310-91.000.
Kuhnlein, Klaus, 4,637,587, Cl. 251-29.000.

Beard, William J.: *See*—
Sonne, Darrell S.; and Beard, William J., 4,638,158, Cl. 250-266.000.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Company. Hydrocracking with phosphomolybdic acid and phosphoric acid. 4,637,870, Cl. 208-112.000.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research and Engineering Company. Hydrocracking with aqueous phosphomolybdic acid. 4,637,871, Cl. 208-112.000.

Beatty, Graydon E.: *See*—
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,637,405, Cl. 128-787.000.

Beatty, Ronald L.; and Wyman, Floyd H., to Atlantic Richfield Company. Continuous silicon carbide whisker production. 4,637,924, Cl. 423-345.000.

Beavers, Allan E., to T. A. Pelsue Company. Hub and strut-endcap assembly for tent frame struts. 4,637,748, Cl. 403-170.000.

Beck, Cyril G.: *See*—
Burke, Michael A.; and Beck, Cyril G., 4,637,448, Cl. 164-122.200.

Beck, Herbert W.; and Franken, Ronald L. Brooder unit and system. 4,637,343, Cl. 119-31.000.

Beck, Paul. Adjustable endless belt. 4,637,810, Cl. 474-253.000.

Bedner, Maria D.: *See*—
Kildea, James M.; Bedner, Maria D.; and Gulick, John J., 4,637,514, Cl. 206-406.000.

Beecham Group p.l.c.: *See*—
Gaster, Laramie M.; and Orlek, Barry S., 4,638,066, Cl. 544-344.000.

Beers, William W.; and Parham, Thomas G., to General Electric Company. Fluorescent lamp containing aluminate phosphor. 4,638,214, Cl. 313-487.000.

Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., to International Business Machines Corporation. Managing data storage devices connected to a digital computer. 4,638,424, Cl. 364-200.000.

Behrend, Steven J.: *See*—
Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., 4,638,072, Cl. 549-234.000.

Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, to La Telemecanique Electrique. Electric switching unit comprising a gas-tight casing for protection of contacts. 4,638,275, Cl. 335-151.000.

Bell Telephone Laboratories: *See*—
Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., 4,637,989, Cl. 501-135.000.

Bell Telephone Laboratories, Inc.: *See*—
Ling, Hung C.; and Yan, Man F., 4,638,401, Cl. 361-321.000.

Beloit Corporation: *See*—
Moen, Carl J., 4,637,434, Cl. 137-625.660.

Ben-Dayan, Nissim: *See*—
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.

Benemann, John R.: *See*—
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.

Benner, Steven A., to Genetics Institute, Inc. Magnetic particles as supports for organic synthesis. 4,638,032, Cl. 525-54.110.

Bennett, George D., to Simmonds Precision. Sealed split instrument housing with foil-backed acrylic transfer adhesive tearband. 4,637,943, Cl. 428-35.000.

Benscoter, Richard D., to Butler Manufacturing Company. Three service afterset. 4,638,115, Cl. 174-48.000.

Benson, Terrance G.; and Lewis, Dean M., to Textron Inc. Lawn mower bedknife adjustment. 4,637,204, Cl. 56-249.000.

Berg, Eitan: *See*—
Shen-Orr, Chaim D.; and Berg, Eitan, 4,638,250, Cl. 324-207.000.

Berg, Norman J.: *See*—
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,637,688, Cl. 350-358.000.

Bergenwall, Henning, to Molnlycke Konsumentprodukter AB. Piece of furniture. 4,637,652, Cl. 297-90.000.

Berger, Richard M., to American Filtrona Corporation. Tobacco smoke filter and method and apparatus for making same. 4,637,409, Cl. 131-336.000.

Bergeron, Richard C.: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.

Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., to Minnesota Mining and Manufacturing Company. Delamination-resistant cellular retroreflective sheeting. 4,637,950, Cl. 428-168.000.

Berglund, Bengt, to Spiro Investment A.G. Fluid flow control valves. 4,637,428, Cl. 137-503.000.

Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, to BASF Aktiengesellschaft. Iron, copper and chromium complexes of disazo dyes. 4,638,055, Cl. 534-678.000.

Berman, Marc. Switching method and device using movable battery. 4,638,409, Cl. 362-104.000.

Bernard, Daniel, to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques. Process for the production of a laminated capacitor. 4,637,106, Cl. 29-25.420.

Bernard, John A., Jr., to Massachusetts Institute of Technology. Apparatus and method for closed-loop control of reactor power. 4,637,911, Cl. 376-217.000.

Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, to Regie Nationale des Usines Renault; and Renix Electronique. Axial acceleration sensor. 4,637,246, Cl. 73-35.000.

Berner, Erwin; and Zettel, Hans-Dieter, to Robert Bosch GmbH. Machine housing. 4,637,196, Cl. 53-77.000.

Bernet, Jean-Marie: *See*—
Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, 4,637,733, Cl. 368-120.000.

Berning, Helmut: *See*—
Schroder, Gunter; and Berning, Helmut, 4,638,234, Cl. 318-661.000.

Bertok, Bela: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Bertoli, Luciano: *See*—
Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, 4,637,205, Cl. 57-22.000.

Bertram, Leo; Bukoschek, Romuald L.; and Steiner, Peter, to U.S. Philips Corporation. Corkscrew device. 4,637,283, Cl. 81-3.200.

Bertrand, Jean-Noel M., to Montefina, S.A. Expanded polypropylene films. 4,638,015, Cl. 521-85.000.

Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,637,140, Cl. 30-276.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Boning and trimming knife. 4,637,140, Cl. 30-276.000.

Beutel, Robert C., to General Electric Company. High voltage transformer. 4,638,220, Cl. 315-411.000.

Bhatia, Sham P.: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,638,384, Cl. 360-77.000.

Bhattacharya, Ajit K., to Texaco Inc. Phosphoramide additives for preparation of organic carbonates. 4,638,076, Cl. 558-277.000.

Bibbee, Jeffrey N.: *See*—
Rhee, Chong-Kon; McKibben, David M.; and Bibbee, Jeffrey N., 4,637,252, Cl. 73-150.00A.

Bicc-Vero Electronics, Inc.: *See*—
Smith, Kenneth R., 4,638,405, Cl. 361-399.000.

Bier, Axel, to Audi NSU Auto Union Aktiengesellschaft. Switching device for lighting the interior of a motor vehicle. 4,638,174, Cl. 307-10.0LS.

Bigelow, Floyd E., Jr.; Bigelow, Floyd E., III; and Bigelow, William H. Knockdown building. 4,637,179, Cl. 52-79.500.

Bigelow, Floyd E., III: *See*—
Bigelow, Floyd E., Jr.; Bigelow, Floyd E., III; and Bigelow, William H., 4,637,179, Cl. 52-79.500.

Bigelow, William H.: *See*—
Bigelow, Floyd E., Jr.; Bigelow, Floyd E., III; and Bigelow, William H., 4,637,179, Cl. 52-79.500.

Bigger, Thomas J.: *See*—
Wachinski, Clarence A.; and Bigger, Thomas J., 4,637,528, Cl. 222-182.000.

Biller, Cleveland J.: *See*—
Johnson, David D.; and Biller, Cleveland J., 4,637,643, Cl. 294-75.000.

Billet, Rene , to Valeo. Clutch release bearing and assembly tool for same. 4,637,506, Cl. 192-110.00B.

Bingo Experience/ARC: *See*—
Bishop, Kevin, 4,637,613, Cl. 273-239.000.

Biosonics, Inc.: *See*—
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,637,405, Cl. 128-787.000.

Birdsall, Raymond P.: *See*—
Ellsworth, Wendell E.; and Birdsall, Raymond P., 4,637,182, Cl. 52-211.000.

Birdsell, Jackie D.: *See*—
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.

Birkedahl, Byron F., to Sperry Corporation. Asymmetric torque switching for aircraft autopilot. 4,638,229, Cl. 318-584.000.

Bishop, F. Avery; and Leahy, Ronald S., to Sperry Corporation. Adaptive interference rejection for improved frequency hop detection. 4,638,493, Cl. 375-1.000.

Bishop, Kevin, to Bingo Experience/ARC. Molded magnetic bingo chip. 4,637,613, Cl. 273-239.000.

Biskup, Andrew L. Fish skin lure. 4,637,160, Cl. 43-42.330.

Black, Maurice. Foot wear dressing aid. 4,637,533, Cl. 223-112.000.

Blackwell, John B. Mower hitch assembly. 4,637,625, Cl. 280-411.00C.

Blain, Roy W. Pressure/viscosity compensated up travel for a hydraulic elevator. 4,637,495, Cl. 187-29.00A.

Blank, Hans G.; and Fox, Jeffrey R., to GTE Laboratories Incorporated. Integrated circuit input-output diagnostic system. 4,638,246, Cl. 324-73.00R.

Blesser, Barry A.; and Prentice, Thomas C., to Pencept, Inc. Position indicating apparatus for use in a digitizing tablet system. 4,638,119, Cl. 178-19.000.

Blezard, Robert C.: *See—*
Evans, Robert D.; and Blezard, Robert C., 4,637,948, Cl. 428-89.000.

Bliesner, Jurgen: *See—*
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, 4,638,404, Cl. 361-388.000.

Block, Aleck. Abrasive apparatus. 4,637,170, Cl. 51-168.000.

Blohm & Voss AG: *See—*
Engelskirchen, Jurgen, 4,637,336, Cl. 114-293.000.

Blomquist, Leonard A.: *See—*
Bartimes, George F.; and Blomquist, Leonard A., 4,637,600, Cl. 271-93.000.

Boardman, Paul A. Armchair with tilting seat. 4,637,654, Cl. 297-337.000.

BOC Group, Inc., The: *See—*
Schroeder, Gerhardt P., 4,637,384, Cl. 128-204.180.

Boda, John W., to Amerock Corporation. Towel ring assembly. 4,637,582, Cl. 248-315.000.

Boehringer Biochemia Robin S.p.A.: *See—*
Moja, Egidio A.; and Gessa, Gianluigi, 4,638,013, Cl. 514-561.000.

Boehringer Mannheim GmbH: *See—*
Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, 4,638,023, Cl. 524-21.000.

Boeing Company, The: *See—*
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., 4,638,437, Cl. 364-427.000.
Lamberty, Bernard J., 4,638,322, Cl. 343-761.000.
Stoecker, Carl H., 4,637,642, Cl. 292-129.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Isocyanic acid-phenyl ester pyridine derivatives. 4,638,069, Cl. 546-300.000.

Boggavarapu, Rao L.: *See—*
Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., 4,638,177, Cl. 307-83.000.

Boggs, Beryl A., to Allied Corporation. Staple cutting for fiber reinforcement material. 4,637,286, Cl. 83-175.000.

Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., to VTC Incorporated. CMOS output buffer providing high drive current with minimum output signal distortion. 4,638,187, Cl. 307-451.000.

Boles, Flounoy W. Apparatus for removing and replacing pipe beneath an earthfill. 4,637,756, Cl. 405-184.000.

Bonanno, Mario; Zinonos, George; and Trantzas, Constantin, to Cangro Industries, Inc. Cigarette holder. 4,637,407, Cl. 131-175.000.

Bond, Irvin D. Press linkage with controlled dwell. 4,637,243, Cl. 72-421.000.

Boos, Gunther, to Alfred Bolz GmbH & Co. KG. Apparatus for transporting articles by fluid flow through a pipe system. 4,637,760, Cl. 406-105.000.

Borbely, Gyorgy: *See—*
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich, 4,637,184, Cl. 52-220.000.

Borg-Warner Corporation: *See—*
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., 4,637,504, Cl. 192-87.170.
Venema, Harry J., 4,637,621, Cl. 200-6.00R.

Borgen, James C.: *See—*
Brough, William R.; and Borgen, James C., 4,638,440, Cl. 364-475.000.

Borning, Jeffrey M.: *See—*
Breske, Carl D.; and Borning, Jeffrey M., 4,637,542, Cl. 228-180.100.

Boschert Inc.: *See—*
Forge, Charles O., 4,638,420, Cl. 363-132.000.

Bossert, Arthur J.: *See—*
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.

Botar, Sandor: *See—*
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Bouboulis, Constantine J., to Exxon Research & Engineering Co. Process for preparing superior high solids coatings. 4,638,031, Cl. 524-773.000.

Bouchal, Robert A. System and game that stimulates creative and verbal exercise. 4,637,799, Cl. 434-236.000.

Boucher, Guy M. G.: *See—*
Cuvelier, Antoine L.; and Boucher, Guy M. G., 4,638,448, Cl. 364-565.000.

Boucher, Paul D.: *See—*
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, 4,637,602, Cl. 271-238.000.

Bourg, Francois: *See—*
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

Boutevin, Bernard: *See—*
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.

Boutni, Omar M.; and Liu, Ping Y., to General Electric Company. Resinous composition of a carbonate resin and a grafted derivative of ethylene-propylene-diene terpolymer exhibiting improved resistance to organic solvents. 4,638,033, Cl. 525-67.000.

Bouwens, Jan M. M.; and Schiffelers, Hendrik E. P., to Oce-Nederland B.V. Holder for a stack of sheets. 4,637,598, Cl. 271-3.100.

Bowden, Roy D., to Imperial Chemical Industries PLC. Chemical process. 4,638,091, Cl. 564-473.000.

Bowe, Woodford A.: *See—*
Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., 4,638,444, Cl. 364-510.000.

Bowers, John E., to AT&T Bell Laboratories. High speed intensity modulated light source. 4,638,483, Cl. 372-26.000.

Bowers, Mark C.: *See—*
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.

Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., to Kennecott Corporation. Sand lump crushing device. 4,637,559, Cl. 241-94.000.

Bowman, Timothy S., to Butler Manufacturing Company. Trench ducts. 4,637,185, Cl. 52-221.000.

Boyle, David E.; and Chrise, James R., to Westinghouse Electric Corp. Quick release guide sleeve assembly. 4,637,914, Cl. 376-353.000.

Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., to United Technologies Corporation. Electric power distribution and load transfer system. 4,638,175, Cl. 307-64.000.

Bradshaw, Kenneth M., to General Electric Company. Circuit for detecting RF coil assembly position in an MR scanner. 4,638,252, Cl. 324-318.000.

Brand, Edward M.: *See—*
Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., 4,637,432, Cl. 137-614.030.

Brandt, Lothar; and Felcht, Utz-Hellmuth, to Hoechst Aktiengesellschaft. Ethers of beta-cyclodextrin and a process for their preparation. 4,638,058, Cl. 536-103.000.

Braun, Ernst: *See—*
Braun, Gert; and Braun, Ernst, 4,637,268, Cl. 74-190.000.

Braun, Gert; and Braun, Ernst, to Halbach & Braun Industrieanlagen. Planer drive. 4,637,268, Cl. 74-190.000.

Braunlich, Peter F.; and Tetzlaff, Wolfgang, to Braunlich, Peter F. Method and apparatus for reading thermoluminescent phosphors. 4,638,163, Cl. 250-337.000.

Brem, Ernst; and Merki, Josef, to BBC Brown, Boveri & Company, Limited. Stator body with laminated compression plates. 4,638,199, Cl. 310-91.000.

Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., to Biosonics, Inc. Apparatus for stimulating salivation. 4,637,405, Cl. 128-787.000.

Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, to IRS Industrie Rationalisierungs-Systeme GmbH. Apparatus for producing positive or negative ions, especially for neutralizing charged workpieces. 4,638,398, Cl. 361-214.000.

Breske, Carl D.; and Borning, Jeffrey M., to Control Data Corporation. Process for soldering and desoldering apertured leadless packages. 4,637,542, Cl. 228-180.100.

Breu, Karl-Jan; and Schinke, Hans-Joachim, to Siemens Aktiengesellschaft. Cradle switch for a telephone apparatus. 4,638,126, Cl. 379-427.000.

Breuer, Oswald: *See—*
Annipajo, Wolfgang; Breuer, Oswald; and Rassmann, Christoph, 4,637,658, Cl. 299-79.000.

Bricaud, Jean-Paul; and Bricaud, Martine. Buckets for compactable products. 4,637,306, Cl. 100-233.000.

Bricaud, Martine: *See—*
Bricaud, Jean-Paul; and Bricaud, Martine, 4,637,306, Cl. 100-233.000.

Brigham & Women's Hospital: *See—*
Walker, Peter S., 4,637,382, Cl. 128-92.00Z.

Brignall, Nicolas L., to Ferranti plc. Reaction force compensator. 4,638,221, Cl. 318-48.000.

Brisson, Alain; and Clement, Jean R., to La Telemecanique Electrique. Noiseless electromagnet and a contactor using such an electromagnet. 4,638,279, Cl. 335-257.000.

British Broadcasting Corporation: *See—*
Clarke, Christopher K. P., 4,638,351, Cl. 358-38.000.

Britoil Public Limited Company: *See—*
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Broadcast Electronics, Inc.: *See—*
Salek, Stanley, 4,638,504, Cl. 381-16.000.

Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., to Bayer Aktiengesellschaft. Process for the removal of residual constituents. 4,637,857, Cl. 159-47.100.

Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, to BASF Aktiengesellschaft. Preparation of methyl methacrylate from methacrolein. 4,638,085, Cl. 560-208.000.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Macrocyclic polyamine and polycyclic polyamine multifunctional lubricating oil additives. 4,637,886, Cl. 252-51.50A.

Brooks, Christopher G.: *See*—
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.

Brooktree Corporation: *See*—
Colles, Joseph H., 4,638,241, Cl. 323-312.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Sakai, Kiyoharu, 4,637,742, Cl. 400-121.000.

Brough, William R.; and Borgen, James C., to Weyerhaeuser Company. Feeding and data entry system for lumber trimmer. 4,638,440, Cl. 364-475.000.

Brown Boveri Reaktor GmbH: *See*—
Scharpenberg, Rainer; and Baro, Gunter, 4,637,912, Cl. 376-245.000.

Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., to General Electric Company. Refractory metal capacitor structures, particularly for analog integrated circuit devices. 4,638,400, Cl. 361-304.000.

Brown, David F.; and Anstey, Michael J. Semiconductor chip carrier. 4,638,348, Cl. 357-74.000.

Brown, G. Emerson, to Allied Corporation. Anti-locking modulating valve for displacement type full power master cylinder. 4,637,662, Cl. 303-6.00R.

Brown, Harold O. Squirrel guard. 4,637,164, Cl. 47-24.000.

Brown, Mark E.: *See*—
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.

Brown, Michael C.; and Kirchanski, Stefan J., to Ortho Diagnostic Systems, Inc. Flow cytometry lysing reagent with leukoprotective agent for producing a 3-part WBC count. 4,637,986, Cl. 436-10.000.

Brown, Omar L.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.

Brown, Wendell E. Telescoping support structure. 4,637,192, Cl. 52-632.000.

Brown & Williamson Tobacco Corporation: *See*—
Luke, John A., 4,637,410, Cl. 131-361.000.

Brudnoy, David M., to United States of America, Energy. Dual beam translator for use in Laser Doppler anemometry. 4,637,717, Cl. 356-28.500.

Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., to General Electric Company. Method for the preparation of chloroformate compositions. 4,638,077, Cl. 558-281.000.

Brunswick Corporation: *See*—
Slattery, Gordon C., 4,637,800, Cl. 440-55.000.
Swisher, Steven L., 4,637,569, Cl. 242-84.20A.

Bryan, James S.: *See*—
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.

Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., to Britoil Public Limited Company. Mechanical spacer for towed acoustic array. 4,638,469, Cl. 367-154.000.

Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., to U.S. Philips Corporation. Computer aided design method and apparatus comprising means for automatically generating pin-to-pin interconnection lists between respective discrete electrical component circuits. 4,638,442, Cl. 364-489.000.

Bryer, Jack, to Motter Printing Press Co. Controlled deflection roller. 4,637,109, Cl. 29-116.0AD.

Bubik, Leslie, to Vulcan Equipment Company, Ltd. Towing apparatus. 4,637,623, Cl. 280-402.000.

Buettner, Gerhard, to Siemens Aktiengesellschaft. Hearing aid with a housing to be worn behind the ear. 4,638,125, Cl. 381-68.400.

Buffalo Weaving and Belting Company: *See*—
Johnson, Charles E.; and New, Richard W., 4,637,511, Cl. 198-846.000.

Bukoschek, Romuald L.: *See*—
Bertram, Leo; Bukoschek, Romuald L.; and Steiner, Peter, 4,637,283, Cl. 81-3.200.

Bullock, Mark E., to Halliburton Company. Magnetic detector apparatus. 4,638,278, Cl. 335-207.000.

Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., to International Business Machines Corporation. Hollow cathode enhanced plasma for high rate reactive ion etching and deposition. 4,637,853, Cl. 156-345.000.

Bunting, Franklin O.; and Hudson, J. Russell, to Gaffney, Richard W.; and Walker, Oliver M. Field decoy transport device. 4,637,647, Cl. 296-24.00R.

Burdette, Everette C.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

Burdick, Jon S.; and Corcoran, Paul T., to Caterpillar Inc. Track shoes having toothed grousers. 4,637,665, Cl. 305-54.000.

Burgard, Francis A. Child safety strap. 4,637,622, Cl. 280-33.99B.

Burke, Michael A.; and Beck, Cyril G., to Westinghouse Electric Corp. Method for production of combustion turbine blade having a single crystal portion. 4,637,448, Cl. 164-122.200.

Burks, Kenneth: *See*—
Jones, Charles; Murphy, James L.; and Burks, Kenneth, 4,637,732, Cl. 368-109.000.

Burlington Industries, Inc.: *See*—
Sutera, Richard; Dressler, John L.; and Halliday, Bruce W., 4,638,327, Cl. 346-75.000.

Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., to Xerox Corporation. Electro-optic line printer with super luminescent LED source. 4,638,334, Cl. 346-108.000.

Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., to Johns Hopkins University, The. Brain imaging radiopharmaceuticals. 4,638,051, Cl. 534-14.000.

Burstell, Helmut: *See*—
Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, 4,637,828, Cl. 71-76.000.

Burt DuPont, Blanche A. Physical therapy device. 4,637,604, Cl. 272-73.000.

Bush, Vincent N.: *See*—
Hiniker, Thomas K.; and Bush, Vincent N., 4,637,547, Cl. 239-1.000.

Butler, Donald E., to Warner Lambert Company. Amnesia reversal with N,N-dialkylaminoalkyl-hexahydro-5-oxo 1H-pyrrolizine-3-carboxamides. 4,638,006, Cl. 514-323.000.

Butler Manufacturing Company: *See*—
Benscoter, Richard D., 4,638,115, Cl. 174-48.000.
Bowman, Timothy S., 4,637,185, Cl. 52-221.000.

C. A. Weidmuller GmbH & Co.: *See*—
Undin, Hans; and Wiener, Hans, 4,637,242, Cl. 72-410.000.

C. Reichert Optishe Werke, AG: *See*—
Sitte, Hellmuth, 4,637,226, Cl. 62-514.00R.

Caburet, Pierre: *See*—
Fourrey, Francois; and Caburet, Pierre, 4,637,655, Cl. 297-410.000.

Cadbury Limited: *See*—
Richards, Brian T., 4,637,788, Cl. 425-4.00R.

Cadbury Schweppes, PLC: *See*—
Jeans, Edward L., 4,637,439, Cl. 141-18.000.

Cafferty, Terrance. Method of stenciling using removable protective coat before applying stencil. 4,637,309, Cl. 101-129.000.

Cain, Dallas E.: *See*—
Eberhard, Jeffrey W.; and Cain, Dallas E., 4,638,499, Cl. 378-7.000.

Calhoun, Gregory L.: *See*—
Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.

Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., to Cilco, Inc. Opthalmic wafer. 4,638,056, Cl. 536-54.000.

Cambria, Emanuel F., to Cars & Concepts, Inc. Latch mechanism for removable roof panel. 4,637,649, Cl. 296-224.000.

Camden, Thomas M., Jr.; and Freeman, Thomas R., to Westinghouse Electric Corp. Nuclear reactor fuel assembly and method of forming same. 4,637,915, Cl. 376-435.000.

Cameron, Neil W.: *See*—
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, to SAMIM Societa Azionaria Minero-Mettallurgica, S.p.A. Process for purifying solutions of zinc sulphate. 4,637,832, Cl. 75-109.000.

Campbell, Colin B.: *See*—
Polk, Matthew S.; and Campbell, Colin B., 4,638,505, Cl. 381-24.000.

Campbell, David C., to Pico Electronics Limited. Electrical appliance control. 4,638,299, Cl. 340-310.00A.

Campbell, Henry F. Prefabricated building panels. 4,637,187, Cl. 52-404.000.

Campbell, Henry F.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,638,001, Cl. 514-212.000.

Canada, Her Majesty the Queen in Right of: *See*—
Oxner, Clifford F. J., 4,637,490, Cl. 181-175.000.

Canadian Occidental Petroleum Ltd.: *See*—
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Canadian Patents and Development Limited: *See*—
Herman, Alex W., 4,637,719, Cl. 356-72.000.

Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee: *See*—
So, Eddy; and Moore, William J. M., 4,638,302, Cl. 340-347.0DA.

Cangro Industries, Inc.: *See*—
Bonanno, Mario; Zinonos, George; and Trantzas, Constantin, 4,637,407, Cl. 131-175.000.

Canon Kabushiki Kaisha: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.
Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, 4,637,342, Cl. 118-719.000.
Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, 4,638,350, Cl. 358-29.000.
Kato, Tokuzo, 4,638,365, Cl. 358-228.000.
Kawabata, Takashi, 4,637,705, Cl. 354-403.000.
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.
Sakane, Toshio; and Tsunekawa, Tokuichi, 4,638,367, Cl. 358-228.000.
Sawamura, Mitsuharu; and Ito, Susumo, 4,637,953, Cl. 428-333.000.

Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.
Suwa, Kaname, 4,638,151, Cl. 235-145.00R.
Suzuki, Kazunori; Katsuta, Hiroo; and Toriumi, Yuki, 4,637,850, Cl. 156-60.000.
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,637,684, Cl. 350-96.190.

Cape Building Products Limited: *See—*
Harper, Stephen; and Hiscock, David G., 4,637,860, Cl. 162-117.000.

Cardwell, Walter T., Jr. Junction field-effect transistor controlled by merged depletion regions. 4,638,344, Cl. 357-22.000.

Carenzi, Angelo: *See—*
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,638,003, Cl. 514-255.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., 4,637,119, Cl. 29-568.000.

Carney, James K.; and Kolbas, Robert M., to Honeywell Inc. Integrated quantum well lasers for wavelength division multiplexing. 4,637,122, Cl. 29-569.00L.

Carp, Ralph W., to Allied Corporation. Symmetrical bridge circuit for measuring mass air flow. 4,637,251, Cl. 73-118.200.

Carpenter, James H.: *See—*
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,637,559, Cl. 241-94.000.

Carr, Damon L. Baseball glove holder and training aid. 4,637,610, Cl. 273-26.00C.

Carr, Francis L.; and Terrill, Larry R., to A. G. Busch & Co., Inc. DC to DC battery charger. 4,638,236, Cl. 320-21.000.

Carrier Corporation: *See—*
Schoch, Stephen A., 4,637,729, Cl. 356-410.000.

Carroll, Curtis E. Rail car positioning system. 4,637,316, Cl. 104-176.000.

Carroll, James J.: *See—*
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.

Cars & Concepts, Inc.: *See—*
Cambria, Emanuel F., 4,637,649, Cl. 296-224.000.

Casaretto, Monika: *See—*
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Case, Cecil L.: *See—*
Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., 4,637,201, Cl. 56-16.400.

Case Western Reserve University: *See—*
Jones, Janice L.; and Jones, Ronald E., 4,637,397, Cl. 128-419.00D.

Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, to Aesculap-Werke AG. Applicator for C-shaped scalp clips. 4,637,395, Cl. 128-334.00R.

Casper, Clemens: *See—*
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.

Casseday, Michael W.: *See—*
Abramovitz, Irwin J.; Berg, Norman J.; and Casseday, Michael W., 4,637,688, Cl. 350-358.000.

Castaneda, Albert A. Auxiliary rear view mirror assembly and outboard mirror. 4,637,694, Cl. 350-626.000.

Caterpillar Inc.: *See—*
Burdick, Jon S.; and Corcoran, Paul T., 4,637,665, Cl. 305-54.000.

Caterpillar Industrial Inc.: *See—*
Fotheringham, James R.; and Morrow, David L., 4,637,488, Cl. 180-253.000.

Caudron, Robert: *See—*
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Cazcarra, Victor; and LeRoueille, Jocelyne, to International Business Machines Corporation. Method of standardizing and stabilizing semiconductor wafers. 4,637,123, Cl. 29-569.00R.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See—*
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.

Celanese Corporation: *See—*
Harris, William F., Jr., 4,637,849, Cl. 149-43.000.

Cellexfabrikerna AB: *See—*
Dahlin, Per O., 4,637,731, Cl. 366-64.000.

Centa, Antony R. Access covers for manholes. 4,637,752, Cl. 404-25.000.

Ceramic Cooling Tower Company: *See—*
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.

Chabanier, Patrick: *See—*
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, 4,637,692, Cl. 350-486.000.

Chalet, Alain R. G., to ITT Corporation. Communication system. 4,638,474, Cl. 370-60.000.

Chamberlain Manufacturing Corporation: *See—*
Schindler, Wayne R., 4,638,433, Cl. 364-400.000.

Chan, Andrew K., to Monolithic Memories, Inc. Short detector for fusible link array using single reference fuse. 4,638,243, Cl. 324-51.000.

Chan, Andy: *See—*
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, 4,638,189, Cl. 307-465.000.

Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, to International Business Machines Corporation. Virtual memory address translation mechanism with controlled data persistence. 4,638,426, Cl. 364-200.000.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Acid-catalyzed xylene isomerization. 4,638,105, Cl. 585-481.000.

Chang, George W. Y., to Westinghouse Electric Corp. Single-ended steam chest with improved support assembly. 4,637,214, Cl. 60-687.000.

Chang, I-Cheng, to Itek Corporation. Acoustically resonant tunable acousto-optic filter. 4,637,689, Cl. 350-372.000.

Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., to Research Corporation. Isolation of a novel antioxidant rosmaridiphenol from *Rosmarinus officinalis* L. 4,638,095, Cl. 568-326.000.

Chappoux, Claude: *See—*
Ricouard, Jacques; and Chappoux, Claude, 4,637,507, Cl. 194-212.000.

Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, to Commissariat a l'Energie Atomique. High-resolution electronic chronometry system. 4,637,733, Cl. 368-120.000.

Chase, Ronald G.: *See—*
Miseyko, George; Peck, Walter R.; and Chase, Ronald G., 4,637,577, Cl. 244-147.000.

Chemical Data Systems, Inc.: *See—*
Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., 4,638,444, Cl. 364-510.000.

Chen, Fu. Ampoule cutter. 4,637,139, Cl. 30-164.900.

Chen, Young K.: *See—*
Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., 4,638,190, Cl. 307-512.000.

Chern, Mao-Jin: *See—*
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., 4,637,678, Cl. 350-3.700.

Chevron Research Company: *See—*
Aagaard, Paul M., 4,637,757, Cl. 405-227.000.

Chevron U.S.A., Inc.: *See—*
Forgac, John M.; and Hoekstra, George R., 4,637,464, Cl. 166-261.000.

Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, to Zambon S.p.A. 1-(4-alkylthiophenyl)-2-(substituted or unsubstituted piperazine-1-yl)-1,3-propanediol, pharmaceutical compositions containing them useful as antiarrhythmic and vasodilating agents. 4,638,003, Cl. 514-255.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Chirdon, Charles P., to Essef Corporation. Antiseal arrangement for hydropneumatic pressure tanks. 4,637,435, Cl. 138-30.000.

Chisso Corporation: *See—*
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Chou, David T.; and Ligon, Robert C., to Union Carbide Corporation. Pesticidal biphenylyloxy and biphenylylalkoxy aryl acyl urea compounds. 4,638,088, Cl. 564-23.000.

Chrise, James R.: *See—*
Boyle, David E.; and Chrise, James R., 4,637,914, Cl. 376-353.000.

Christ, Howard N. Sail having a honeycomb array of pockets. 4,637,333, Cl. 114-103.000.

Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., to PPG Industries, Inc. Aqueous composition comprising a phosphated epoxy and non-self dispersible resin. 4,638,020, Cl. 523-406.000.

Christian Mayr GmbH & Co. KG: *See—*
Mayr, Fritz; and Dasser, Manfred, 4,637,502, Cl. 192-56.00R.

Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., to RCA Corporation. Timing correction for a picture-in-picture television system. 4,638,360, Cl. 358-148.000.

Chrysler Motors Corporation: *See—*
Killen, H. Ron; Wilkins, Scott A.; and Frantz, Douglas C., 4,637,361, Cl. 123-339.000.
Perkins, David J., 4,637,628, Cl. 280-689.000.
Secord, Nelson W., 4,637,097, Cl. 24-16.0PB.

Chua, Lye-Whatt, to U.S. Philips Corporation. R.F. system. 4,638,319, Cl. 342-417.000.

Chuohatsujyo Kabushiki Kaisha: *See—*
Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, 4,637,595, Cl. 267-52.000.

Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., to Apache Powder Company. High density gel explosive. 4,637,848, Cl. 149-21.000.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; and Drabek, Jozef, 4,638,069, Cl. 546-300.000.
Dyer, Ross M. W.; and Nowak, Edward, 4,637,830, Cl. 71-105.000.
Phillips, Emyr; and Holt, Brian, 4,637,926, Cl. 423-573.00R.
Schurter, Rolf; and Pissiotas, Georg, 4,637,829, Cl. 71-90.000.

Cilco, Inc.: *See—*
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Cirillo, Nicholas C., Jr.: *See—*
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., 4,638,341, Cl. 357-15.000.

Citizen Watch Co., Ltd.: *See—*
Ikeda, Hiroshi, 4,637,537, Cl. 226-76.000.

Claassens, Marinus L. M.: *See—*
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Clark, C. Randall, to Research Corporation. Anticonvulsant method and formulations. 4,638,014, Cl. 514-619.000.
Clark, Garry E. Fluid driven power plant. 4,637,209, Cl. 60-595.000.
Clark, John L., Jr.: *See*—
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.
Clark, Richard N., to Tecla Company, Inc. Fold-down seat construction. 4,637,081, Cl. 5-18.00R.
Clark, Robert A., Jr., to Communications Equipment and Engineering Co. Telephone pay station. 4,638,121, Cl. 379-145.000.
Clarke, Christopher K. P., to British Broadcasting Corporation. Adaptive filter for use in color video signal processing. 4,638,351, Cl. 358-38.000.
Claude, Lombard: *See*—
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Claude, Moyses: *See*—
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, to Hoechst Aktiengesellschaft. Process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts. 4,638,063, Cl. 544-2.000.
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., to Boeing Company, The. Aircraft performance margin indicator. 4,638,437, Cl. 364-427.000.
Clement, Jean R.: *See*—
Brisson, Alain; and Clement, Jean R., 4,638,279, Cl. 335-257.000.
Clouth Gummiwerke Aktiengesellschaft: *See*—
Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, 4,637,646, Cl. 295-37.000.
CMI Corporation: *See*—
Swisher, George W., Jr., 4,637,753, Cl. 404-90.000.
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., to KCR Technology, Inc. Electrographic charge deposition apparatus. 4,638,339, Cl. 346-153.100.
Coca-Cola Company, The: *See*—
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.
Cochran, Susan, to TRW Inc. Electric submergible motor with bearing assembly isolated from axial loads. 4,638,198, Cl. 310-871.000.
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Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.
Codrington, Ernest R. Pilot fuel regulating device. 4,637,353, Cl. 123-27.0GE.
Cohen, Marc M., to United States of America, National Aeronautics and Space Administration. Elevated waterproof access floor system and method of making the same. 4,637,181, Cl. 52-126.500.
Cohen, Sidney: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.
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Levasseur, Joseph L., 4,637,523, Cl. 221-13.000.
Colatsky, Thomas J.: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,638,008, Cl. 514-411.000.
Cole, James, to Dee Cramer, Inc. Filter assembly for an exhaust stack. 4,637,300, Cl. 98-60.000.
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., to AMP Incorporated. Dual in-line package carrier assembly. 4,637,670, Cl. 339-46.000.
Colles, Joseph H., to Brooktree Corporation. Regulated current supply. 4,638,241, Cl. 323-312.000.
Collins, John M.: *See*—
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,637,322, Cl. 108-102.000.
Collins, Stuart M. Multi part butt and reel seat used on fishing rods. 4,637,157, Cl. 43-22.000.
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Cowles, Warren H., 4,637,366, Cl. 123-568.000.
Combustion Engineering, Inc.: *See*—
Dunn, Mark R., 4,637,556, Cl. 241-48.000.
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Comino, Vittorio: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.
Commissariat a l'Energie Atomique: *See*—
Charles, Gilbert; Assadoullah, Assad; and Bernet, Jean-Marie, 4,637,733, Cl. 368-120.000.
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
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Ive, Richard A., 4,638,272, Cl. 333-236.000.
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Clark, Robert A., Jr., 4,638,121, Cl. 379-145.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See*—
Herve, Robert J. L. A., 4,638,120, Cl. 178-22.080.
Connell, G. A. Neville; and Godwin, Jimmy D., to Xerox Corporation. Apparatus using beam splitter cube with specific characteristics for reading information recorded in a magneto-optic medium. 4,638,470, Cl. 369-13.000.
Conner, Edward. Opto electric combination lock. 4,637,235, Cl. 70-277.000.
Consaga, John P.: *See*—
Austin, Theodore D.; and Consaga, John P., 4,638,316, Cl. 342-14.000.
Consoli, Ronald P.: *See*—
Marshall, Ralph C.; and Consoli, Ronald P., 4,637,225, Cl. 62-285.000.
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Zabotto nee Arribau, Arlette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, 4,637,933, Cl. 424-131.000.
Conti, Anthony L.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.
Continental Pharma: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.
Continental Plastic Containers, Inc.: *See*—
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Control Data Corporation: *See*—
Breske, Carl D.; and Borning, Jeffrey M., 4,637,542, Cl. 228-180.100.
Cook, Incorporated: *See*—
Cook, William A., 4,637,396, Cl. 128-344.000.
Cook, James R.: *See*—
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.
Cook, John. Tool for removing and reapplying rivets. 4,637,113, Cl. 29-243.540.
Cook, Norman E. Electronic detection device for motorized vehicles. 4,637,359, Cl. 123-179.00B.
Cook, Richard A.: *See*—
Bryant, Stewart F.; Baker, Stephen J.; and Cook, Richard A., 4,638,442, Cl. 364-489.000.
Cook, William A., to Cook, Incorporated. Balloon catheter. 4,637,396, Cl. 128-344.000.
Cooley, Denton A.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.
Coon, Paul A.: *See*—
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Cooperman, Michael; and Sieber, Richard W., to GTE Laboratories Incorporated. Two wire bidirectional digital transmission system. 4,638,473, Cl. 370-27.000.
Cope, Carroll W., to DG Shelter Products. Molding coating composition and process. 4,638,022, Cl. 524-15.000.
Corcoran, Paul T.: *See*—
Burdick, Jon S.; and Corcoran, Paul T., 4,637,665, Cl. 305-54.000.
Cordis Laboratories, Inc.: *See*—
Halbert, Seymour P., 4,637,880, Cl. 210-638.000.
Cornelison, Richard C. Mandrel for winding flexible metal catalyst core. 4,637,568, Cl. 242-68.500.
Cornell Research Foundation, Inc.: *See*—
Ravnitzky, Michael J., 4,637,576, Cl. 244-145.000.
Corning Glass Works: *See*—
DeAngelis, Thomas P.; and Lachman, Irwin M., 4,637,995, Cl. 502-439.000.
Corona, Fredrick W.: *See*—
Owens, Brian T.; and Corona, Fredrick W., 4,637,608, Cl. 272-134.000.
Coronet-Werke Heinrich Schlerf GmbH: *See*—
Weihrauch, Georg, 4,637,660, Cl. 300-21.000.
Costa De Beauregard, Francois: *See*—
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, 4,638,160, Cl. 250-296.000.
Costa, Jorge; and Reichel, Wolfgang, to Hermes Precisa International S.A. Cassette for a sheet feed device. 4,637,601, Cl. 271-160.000.
Cotteret, Jean: *See*—
Monnais, Christian; and Cotteret, Jean, 4,637,821, Cl. 8-415.000.
Covino, Josephine; and McManis, George E., to United States of America, Navy. Electrochemical synthesis of ternary phosphides. 4,637,864, Cl. 204-61.000.
Cowles, Warren H., to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,637,366, Cl. 123-568.000.
Cox, Dan L.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.
Crabtree, Paul J.; and Imakawa, Kazuhiko, to Procter & Gamble Company, The. Detergent composition providing rinse cycle suds and turbidity control containing a soap, quaternary ammonium salt and a silicone. 4,637,890, Cl. 252-90.000.
Craelius AB: *See*—
Jonsson, Nils G., 4,637,477, Cl. 173-149.000.
Craig, Daniel L.: *See*—
White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H., 4,637,211, Cl. 60-650.000.
Crane, Michael P.; and Marsh, David J., to Membrain Limited. Method and apparatus for generating sequence of multibit words. 4,638,481, Cl. 371-27.000.

Crane, Terry N.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.

Cranford, Hayden C., Jr.; and Garvin, Stacy J., to International Business Machines Corp. Charge pump system for non-volatile ram. 4,638,464, Cl. 365-226.000.

Cray Research, Inc.: *See*—
Cray, Seymour R., 4,638,188, Cl. 307-453.000.

Cray, Seymour R., to Cray Research, Inc. Phase modulated pulse logic for gallium arsenide. 4,638,188, Cl. 307-453.000.

Crews, Nancy B.: *See*—
Simmons, Billy R., 4,637,156, Cl. 43-21.200.

Crooks, Robert C., to Barcus-Berry Electronics, Inc. Reference load amplifier correction system. 4,638,258, Cl. 330-149.000.

Crothers, Steven D., to Owens-Corning Fiberglas Corporation. Splicing means for faced insulation batts. 4,637,188, Cl. 52-404.000.

Crown Zellerbach Corporation: *See*—
Matovich, Edwin; and Spannuth, Robert J., 4,637,858, Cl. 162-30.100.

Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., to Warner-Lambert Co. Antibacterial agents. 4,638,067, Cl. 546-15.000.

Cummings, Robert J., to Rockwell International Corporation. Non-encumbering torso restraint system. 4,637,629, Cl. 280-801.000.

Cuomo, Jerome J.: *See*—
Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.

Curro, John J.: *See*—
Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.

Custer, Russell C.: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.

Custom Sample Systems, Inc.: *See*—
Ponstingl, Michael J.; Trump, Walter N.; and Kessler, Robert C., 4,637,730, Cl. 356-411.000.

Cuvelier, Antoine L.; and Boucher, Guy M. G., to Huret et ses Fils. Electronic odometer in particular for a cycle. 4,638,448, Cl. 364-565.000.

Cycles Peugeot: *See*—
Fourrey, Francois; and Caburet, Pierre, 4,637,655, Cl. 297-410.000.

Czelusniak, Paul A., Jr., to Fieldcrest Mills, Inc. Tufting machine with modular constructed needle bars. 4,637,329, Cl. 112-80.450.

Dach, Michael M., to Texaco Inc. High temperature furnace. 4,637,823, Cl. 48-77.000.

Dahlin, Per O., to Cellexfabrikerna AB. Device for making porous concrete. 4,637,731, Cl. 366-64.000.

Daicel Chemical Industries, Ltd.: *See*—
Takahashi, Shigeyuki; Uchida, Manabu; and Yamazaki, Kazuhiro, 4,638,057, Cl. 536-76.000.

Daidotokushuko Kabushikikaisha: *See*—
Shimomoto, Yasunobu, 4,638,488, Cl. 373-22.000.

Daigne, Bernard: *See*—
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, 4,638,160, Cl. 250-296.000.

Daigo, Yukitaka: *See*—
Nishi, Yoshitsugu; and Daigo, Yukitaka, 4,638,501, Cl. 378-182.000.

Daihatsu Motor Co., Ltd.: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.

Daihen Corporation: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.

Daikin Industries, Ltd.: *See*—
Matoba, Yoshiaki; and Ozawa, Hitoshi, 4,637,786, Cl. 418-55.000.
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, 4,638,041, Cl. 526-247.000.

Daikin Kogyo Co., Ltd.: *See*—
Hisamoto, Iwao; Maeda, Chiaki; and Nishiwaki, Mitsuhiro, 4,638,089, Cl. 564-292.000.

Daimler-Benz Aktiengesellschaft: *See*—
Parisch, Jochen; and Herlemann, Werner, 4,637,116, Cl. 29-441.00R.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, 4,638,052, Cl. 534-575.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Fujii, Teruo; and Tsutsui, Tomikazu, 4,637,710, Cl. 355-72.000.

Dakin, John P., to Plessey Overseas Limited. Optical fibre sensing arrangements. 4,638,153, Cl. 250-227.000.

Dakin, Wayne R., to Discovision Associates. Selectable video/audio coded data recovery from a record medium. 4,638,377, Cl. 358-343.000.

Dalo, Jean: *See*—
Dalo, Pierre; and Dalo, Jean, 4,637,415, Cl. 135-98.000.

Dalo, Pierre; and Dalo, Jean. Light shelter in the form of a tent comprising a roof constituted by a canvas. 4,637,415, Cl. 135-98.000.

Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., to Eaton Corporation. Speed control system with feedback and soft-start. 4,638,226, Cl. 318-345.00R.

Damsky, Walter: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.

Dana Corporation: *See*—
Otteson, Jack O., 4,637,485, Cl. 180-175.000.

Daniel, Richard A.: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.

Daniels, Edward P., to Pitney Bowes Inc. Postage metering system with display. 4,638,439, Cl. 364-446.000.

Dannals, Robert F.: *See*—
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.

Dappen, Glen M., to Eastman Kodak Company. Assay for analysis of whole blood. 4,637,978, Cl. 435-11.000.

Darton, Kenneth S., to Standard Telephones & Cables Public Limited Company. Distributed digital signal multiplexing. 4,638,480, Cl. 370-112.000.

Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., to PPG Industries, Inc. Sized glass fibers and reinforced polymers containing same. 4,637,956, Cl. 428-391.000.

Das, Jagabandhu, to E. R. Squibb & Sons, Inc. Tetrahydrothienyl substituted prostaglandin analogs. 4,638,011, Cl. 514-438.000.

Dasser, Manfred: *See*—
Mayr, Fritz; and Dasser, Manfred, 4,637,502, Cl. 192-56.00R.

Davis, Bayard C., to XCO International, Inc. Heat sensitive tape and method of making same. 4,638,107, Cl. 136-237.000.

Davis, Robert E., to Arkansas Patents, Inc. Pulsing combustion. 4,637,792, Cl. 431-1.000.

Davis, Ronald G., to Keathley, H. Milton; and Phenix, Douglas Michael. Anticorrosion battery terminal. 4,637,965, Cl. 429-1.000.

Davis, Roy E. Reinforcing member for wooden structure. 4,637,195, Cl. 52-693.000.

Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., to Westinghouse Electric Corp. Wide band microwave analog phase shifter. 4,638,269, Cl. 333-164.000.

Dawson, Paul H.: *See*—
Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.

Dayco Corporation: *See*—
Long, Delmar D., 4,637,940, Cl. 427-176.000.
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.

Dayton Reliable Tool & Mfg. Co.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.

DBM Industries Limited: *See*—
Perrella, Guido; and Thompson, William E., 4,637,451, Cl. 164-342.000.

DE-BI Derivati Biologici International SpA: *See*—
Elefante, Biagio, 4,638,081, Cl. 560-40.000.

De-Sta-Co Division/Dover Corporation: *See*—
McPherson, Alexander W.; and Hamed, Hazem N., 4,637,597, Cl. 269-32.000.

Deal, Samuel B.; and Bartch, Donald W., to RCA Corporation. CRT with internal contact stripe or patch and method of making said stripe or patch. 4,638,213, Cl. 313-479.000.

Dean, Walter C., III: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

DeAngelis, Thomas P.; and Lachman, Irwin M., to Corning Glass Works. Preparation of monolithic catalyst supports having an integrated high surface area phase. 4,637,995, Cl. 502-439.000.

DeBoer, Charles D.; and Luckey, George W., to Eastman Kodak Company. Fluorescent compositions, x-ray intensifying screens, and processes for making same. 4,637,898, Cl. 252-301.360.

de Brunier, Bernard: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.

de Campos, Joaquim C.: *See*—
Barbosa, Antonio B.; and de Campos, Joaquim C., 4,637,517, Cl. 211-86.000.

DeCarlo, David J.: *See*—
Rynk, Anthony J.; and DeCarlo, David J., 4,637,136, Cl. 29-872.000.

Decima, Fredy, to ABG Semca. Rapid discharge extinguisher. 4,637,472, Cl. 169-35.000.

Deczky, Andrew E., to R.F.J. Associates Limited, a part interest. Data acquisition system for the computer control of aluminum smelters. 4,638,441, Cl. 364-483.000.

Dee Cramer, Inc.: *See*—
Cole, James, 4,637,300, Cl. 98-60.000.

Deere & Company: *See*—
Hauk, Klaus, 4,638,276, Cl. 335-151.000.

Deiss, Michael S., to RCA Corporation. Signal source selector. 4,638,181, Cl. 307-243.000.

Deiss, Willy-Jean: *See*—
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.

Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, to Commissariat a l'Energie Atomique. Electron cyclotron resonance ion source. 4,638,216, Cl. 315-111.810.

Della Bella, Davide: *See*—
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,638,003, Cl. 514-255.000.

Delta Electronics: *See*—
Wright, Charles S., 4,638,503, Cl. 381-16.000.

Delta Kogyo Co., Ltd.: *See*—
Okino, Kiyomi; and Muramoto, Takumi, 4,637,648, Cl. 296-63.000.
Delwel, Francois; and Claassens, Marinus L. M., to Lever Brothers Company. Process for the manufacture of detergent compositions containing sodium aluminosilicate. 4,637,891, Cl. 252-135.000.
DeMeyer, Roy W., to Johnson Service Company. Pneumatic differential pressure controller. 4,637,546, Cl. 236-49.000.
Dempsey, Donald J.: *See*—
Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., 4,638,043, Cl. 528-75.000.
deNeufville, John P.: *See*—
Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., 4,637,938, Cl. 427-53.100.
Denimal, Philippe, to PROGE. Rapid profile recording device. 4,638,354, Cl. 358-106.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Masui, Takeshi; and Sano, Morio, 4,637,945, Cl. 428-35.000.
DeRespinis, Silvio F.: *See*—
Frank, Arthur M.; DeRespinis, Silvio F.; and Mockovciak, John, Jr., 4,637,447, Cl. 160-265.000.
Derichs, Josef, to W. Schlafhorst & Co. Pneumatic spinning method and pneumatic spinning device. 4,637,207, Cl. 57-282.000.
de Ris, John; and Markstein, George H., to Factory-Mutual Research Corporation. Bench-scale material flammability test apparatus and process for measuring flammability. 4,637,735, Cl. 374-8.000.
Derkits, Gustav E., Jr.; and Harbison, James P., to AT&T Bell Laboratories. Selective area III-V growth and lift-off using tungsten patterning. 4,637,129, Cl. 29-578.000.
de Roure, Olivier P. R., to Manufacture de Rougement. Wound coil of tie material packaged on a display base, and a process for producing it. 4,637,516, Cl. 206-471.000.
Derrick, John M. Method and apparatus for multizone oil and gas production. 4,637,468, Cl. 166-297.000.
Descas, Patrick: *See*—
Feniou, Claude; and Descas, Patrick, 4,638,082, Cl. 560-62.000.
DeShazer, Larry G.: *See*—
Rand, Stephen C.; and DeShazer, Larry G., 4,638,484, Cl. 372-42.000.
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., to Jacuzzi Inc. Front load skimmer/filter for spas and pools. 4,637,873, Cl. 210-169.000.
D'Este, Arturo: *See*—
Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, 4,637,832, Cl. 75-109.000.
Deutsche Gesellschaft: *See*—
Stritzke, Detlef, 4,638,134, Cl. 219-9.500.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Schroder, Gunter; and Berning, Helmut, 4,638,234, Cl. 318-661.000.
Deutsche Perrot-Bremse GmbH: *See*—
Rupprecht, Bernd, 4,637,499, Cl. 188-79.50R.
de Vos, Hendrik A. J.; and Labouliere, Elzear R., to GTE Products Corporation. Luminaire with rotatable reflector. 4,638,414, Cl. 362-370.000.
DeVries, James H., to Baxter Travenol Laboratories, Inc. Blood processing assembly including a prepackaged fluid circuit module. 4,637,813, Cl. 604-6.000.
De Witt, Elmer J.: *See*—
Li, George S.; Wu, Muyen M.; and De Witt, Elmer J., 4,638,042, Cl. 526-280.000.
DG Shelter Products: *See*—
Cope, Carroll W., 4,638,022, Cl. 524-15.000.
Dibbler, Inc.: *See*—
Topham, Arnold. J.; and Wilson, Harry W., 4,637,328, Cl. 111-89.000.
Dickens, Lawrence E.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.
Diesel Kiki Co., Ltd.: *See*—
Kushida, Takeo; and Yamada, Keiichi, 4,637,553, Cl. 239-533.400.
Dietiker, Paul; and Nelson, Marvin D., to Honeywell Inc. Fluid pressure regulating valve having adjustable two-stage and natural-LP gas changeover capabilities. 4,637,429, Cl. 137-505.140.
Dillard, Guy W.: *See*—
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.
D'Incan, Esther: *See*—
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.
D'Innocente, Ralph: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.
Discovision Associates: *See*—
Dakin, Wayne R., 4,638,377, Cl. 358-343.000.
Dixon Industries Corporation: *See*—
Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, 4,637,856, Cl. 156-637.000.
Dobbs, Teena L.: *See*—
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., 4,637,678, Cl. 350-3.700.
Dobring, Wilfried: *See*—
Baitz, Guenter; and Dobring, Wilfried, 4,637,326, Cl. 109-49.000.
Dobson Park Industries, PLC: *See*—
Mann, Derek, 4,637,816, Cl. 604-62.000.
Docherty, James P.: *See*—
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., 4,637,795, Cl. 432-138.000.
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., to Merck & Co., Inc. Substituted cephalosporins as anti-inflammatory and antidegenerative agents. 4,637,999, Cl. 514-201.000.
Doi, Takashi: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.
Dolgos nee Kekesi, Krisztina: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.
Domagala, John M.: *See*—
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.
Donath, Sabine; and Holz, Peter, to Messer Griesheim GmbH. Device and method for the surface treatment of cold-embrittled parts. 4,637,174, Cl. 51-425.000.
Doorenbos, Daryl E. Device for assisting in putting on elastic hosiery. 4,637,532, Cl. 223-111.000.
Dorr, Konrad, to Dr.Ing.h.c.F. Porsche Aktiengesellschaft. Optoelectronic measuring device. 4,638,155, Cl. 250-231.0SE.
Dosai, Takayoshi: *See*—
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, 4,637,112, Cl. 29-159.010.
Dosoudil, Martin. Disc shaped filter element. 4,637,876, Cl. 210-331.000.
Dost, Willibald; and Kreutzer, Hans, to Siemens Aktiengesellschaft. Adjustment device for a reflector mirror of a laser resonator. 4,638,486, Cl. 372-107.000.
Dotzauer, Ewald: *See*—
Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, 4,638,123, Cl. 379-229.000.
Dover Corporation: *See*—
Atkey, Richard E.; and Gilliland, Oscar E., 4,637,496, Cl. 187-95.000.
Dow Chemical Company, The: *See*—
Kildea, James M.; Bedner, Maria D.; and Gulick, John J., 4,637,514, Cl. 206-406.000.
Kirchhoff, Robert A., 4,638,078, Cl. 558-414.000.
Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., 4,638,075, Cl. 558-5.000.
Lane, George A.; and Rossow, Harold E., 4,637,888, Cl. 252-70.000.
Little, Douglas J., 4,638,102, Cl. 568-724.000.
Maria van Riet, Wilhelmus A., 4,637,189, Cl. 52-309.800.
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., 4,638,168, Cl. 250-560.000.
Wang, Pen-Chung; and Renga, James M., 4,638,064, Cl. 544-54.000.
Dowell Schlumberger Incorporated: *See*—
Kennedy, Weldon C., Jr., 4,637,899, Cl. 252-542.000.
Dr.Ing.h.c.F. Porsche Aktiengesellschaft: *See*—
Dorr, Konrad, 4,638,155, Cl. 250-231.0SE.
Drabek, Jozef: *See*—
Boger, Manfred; and Drabek, Jozef, 4,638,069, Cl. 546-300.000.
Drageerwerk AG: *See*—
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Drake, Donald J.; Hawkins, William G.; Markham, Roger G.; and LaDonna, Richard V., to Xerox Corporation. Printhead for an ink jet printer. 4,638,328, Cl. 346-75.000.
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, to Westinghouse Electric Corp. Compact model steam generator having multiple primaries. 4,637,346, Cl. 122-4.00A.
Dresser Industries, Inc.: *See*—
McGlothen, Jody R.; and Little, Damon P., 4,637,460, Cl. 166-189.000.
Patel, Arvind D.; and Salandanan, Carmelita S., 4,637,883, Cl. 252-8.515.
Spriggs, Dennis M.; and McGlothen, Jody R., 4,637,469, Cl. 166-310.000.
Dressler, John L.: *See*—
Sutera, Richard; Dressler, John L.; and Halliday, Bruce W., 4,638,327, Cl. 346-75.000.
Dreuilhe, Claude: *See*—
Obrecht, Georges; and Dreuilhe, Claude, 4,637,480, Cl. 175-45.000.
Dreyer, Adolf; and Roozenbeek, Herman, to Robert Bosch GmbH. Method of recognizing knocking signals in a received signal derived from a knocking sensor in an internal combustion engine, and system carrying out the method. 4,637,247, Cl. 73-35.000.
Drogin, Edwin M., to Eaton Corporation. Unambiguous wide baseline interferometer. 4,638,321, Cl. 342-444.000.
D'Silva, Themistocles D. J.: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.
Du-Al Manufacturing Company: *See*—
Stumpe, Leroy, 4,637,772, Cl. 414-686.000.
Duembgen, Gerd: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.
Duerig, Thomas: *See*—
Albrecht, Joachim; and Duerig, Thomas, 4,637,962, Cl. 428-616.000.

Dufrasnes, Jean-Claude, to Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme. Electrical contacts for oscillating yoke of load selector. 4,638,127, Cl. 200-11.00K.
Duke, Jack L.: *See*—
White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H., 4,637,211, Cl. 60-650.000.
Dukes, John N.: *See*—
Baumgartner, Richard A.; Dukes, John N.; and Fisher, George A., 4,638,191, Cl. 307-602.000.
Dunbar, Joseph E.: *See*—
Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., 4,638,075, Cl. 558-5.000.
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., to Owens-Corning Fiberglas Corporation. Melting furnaces. 4,638,490, Cl. 373-35.000.
Dunn, Mark R., to Combustion Engineering, Inc. High efficiency separator system. 4,637,556, Cl. 241-48.000.
Du Pont de Nemours, E. I., and Company: *See*—
Adams, Philip E.; McGowan, Michael J.; and Yunan, Malak E., 4,637,312, Cl. 102-275.120.
Elias, John G.; and Jansson, Allan P., 4,638,456, Cl. 364-518.000.
Durden, John A.: *See*—
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., 4,637,901, Cl. 260-544.00C.
Dutt, Herbert V.; and Santostasi, Paul A., to Sun Coast Plastics, Inc. Two part closure. 4,637,519, Cl. 215-232.000.
Dvorak, Robert F.; and Netolicky, Charles E., to Square D Company. Rotary switch assembly. 4,638,133, Cl. 200-302.100.
Dyben, Jerry F.; and Wulc, Stanley S., to Tokheim Corporation. Gauge apparatus for measuring liquid levels. 4,637,254, Cl. 73-314.000.
Dyer, Gerald P., to United Technologies Corporation. Metering valve. 4,637,420, Cl. 137-242.000.
Dyer, Ross M. W.; and Nowak, Edward, to Ciba-Geigy Corporation. Herbicidal concentrates. 4,637,830, Cl. 71-105.000.
Dylewski, Anthony J.: *See*—
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.
Dytch, Anthony; Keatley, Andrew; and Wright, William. Microprocessor controlled through-flow electric water heater. 4,638,147, Cl. 219-308.000.
E. R. Squibb & Sons, Inc.: *See*—
Das, Jagabandhu, 4,638,011, Cl. 514-438.000.
Kronenthal, David, 4,638,062, Cl. 540-355.000.
Nakane, Masami, 4,638,012, Cl. 514-469.000.
Slusarchyk, William A.; and Koster, William H., 4,638,061, Cl. 540-355.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,638,060, Cl. 540-203.000.
Weller, Harold N., III; and Gordon, Eric M., 4,638,010, Cl. 514-423.000.
E.S.G. Controls, Ltd.: *See*—
Robinson, Anthony, 4,637,349, Cl. 122-448.00B.
Earle, George A., III: *See*—
Murray, William J.; and Earle, George A., III, 4,637,761, Cl. 408-16.000.
Eash, Matthew G.: *See*—
Jaskolski, Patrick L.; and Eash, Matthew G., 4,638,253, Cl. 324-318.000.
Eastman Kodak Company: *See*—
Dappen, Glen M., 4,637,978, Cl. 435-11.000.
DeBoer, Charles D.; and Luckey, George W., 4,637,898, Cl. 252-301.360.
Hinshaw, Jerald C.; Toner, John L.; and Reynolds, George A., 4,637,988, Cl. 436-546.000.
Milch, James R., 4,638,371, Cl. 358-293.000.
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.
Eaton Corporation: *See*—
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., 4,638,226, Cl. 318-345.00R.
Drogin, Edwin M., 4,638,321, Cl. 342-444.000.
Gritter, David J., 4,638,224, Cl. 318-254.000.
Eberhard, Jeffrey W.; and Cain, Dallas E., to General Electric Company. High resolution collimator system for X-ray detector. 4,638,499, Cl. 378-7.000.
Ebner, Howard A., to Resinoid Engineering Corporation. Commutator and method of making same. 4,638,202, Cl. 310-235.000.
Economy, George: *See*—
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, 4,637,346, Cl. 122-4.00A.
Ed. Zublin Aktiengesellschaft: *See*—
Fastenau, Werner, 4,637,586, Cl. 249-159.000.
Edakubo, Hiroo: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.
Edberg, Dan O., to A/S Ingeniorgruppen AF. Beater mill having at least one vertically or obliquely extending cylindrical milling chamber. 4,637,561, Cl. 241-154.000.
Eerola, Matti V., to Raute Oy. Suction-lifting conveyor for transfer for sheet-shaped objects. 4,637,599, Cl. 271-5.000.
Eesley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., to General Motors Corporation. Wire-glass composite and method of making same. 4,637,862, Cl. 204-15.000.
Egami, Hidemi: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.
Eggert, Dennis J.; Hendrix, Charles E.; and Krinsky, Barnet, to Hughes Aircraft Company. Direction finding interferometer. 4,638,320, Cl. 342-442.000.
Egli, Werner H.; and Weber, Mark W., to Honeywell Inc. Discriminant apparatus for ring laser angular rate sensors. 4,637,723, Cl. 356-350.000.
Eguchi, Mamoru: *See*—
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, 4,637,200, Cl. 53-551.000.
Ehlert, Charles W., to Lubricating Systems Company of Texas, Inc. Mist generators. 4,637,493, Cl. 184-55.100.
Elabd, Hammam; and Kosonocky, Walter F., to RCA Corporation. IR imaging array and method of making same. 4,638,345, Cl. 357-24.000.
Eldrige, John D., Jr., to Instranetics, Inc. Disposable surgical implement collector. 4,637,513, Cl. 206-370.000.
Elefante, Biagio, to DE-BI Derivati Biologici International SpA. Process for preparing α-aspartyl-L-phenylalanine methyl ester. 4,638,081, Cl. 560-40.000.
Elektroschmelzwerk Kempten GmbH: *See*—
von Matuschka, Alfred G.; and Trausner, Norbert, 4,637,837, Cl. 148-6.000.
Eli Lilly and Company: *See*—
Hershberger, Charles L.; Merkel, Kurt E.; Weeks, Robert E.; and Wild, Gene M., 4,637,981, Cl. 435-75.000.
Elias, John G.; and Jansson, Allan P., to Du Pont de Nemours, E. I., and Company. Spot quantitation. 4,638,456, Cl. 364-518.000.
Ellingboe, Edmund G. Theft resistant condiment container. 4,637,526, Cl. 222-146.200.
Ellison, Donald E., to United Technologies Automotive, Inc. Wire cross-over arrangement for coil assembly. 4,638,282, Cl. 336-185.000.
Ellsworth, Wendell E.; and Birdsall, Raymond P., to Algoma Hardwoods, Inc. Windowed fire door. 4,637,182, Cl. 52-211.000.
Elpatronic AG: *See*—
Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, 4,637,521, Cl. 220-274.000.
Elrod, Scott A., to Xerox Corporation. Capillary wave controllers for nozzleless droplet ejectors. 4,638,338, Cl. 346-140.00R.
Elscint Ltd.: *See*—
Melman, Haim, 4,638,355, Cl. 358-111.000.
Emerson Electric Co.: *See*—
Sciuto, George J., 4,637,881, Cl. 210-689.000.
Emhart Industries, Inc.: *See*—
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, 4,637,827, Cl. 65-235.000.
EMS-Inventa AG: *See*—
Rehmann, Robert, 4,637,311, Cl. 102-209.000.
Enberg, Helge, to AB Bahco Ventilation. Air supply device. 4,637,302, Cl. 98-115.300.
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, to Hitachi, Ltd. Navigation apparatus for automotive. 4,638,438, Cl. 364-449.000.
Endo, Nobuhiro: *See*—
Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, 4,637,127, Cl. 29-576.00E.
Endo, Yukio: *See*—
Rollhaus, Philip; and Endo, Yukio, 4,638,306, Cl. 340-365.00R.
Energy Conversion Devices, Inc.: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.
Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., 4,637,938, Cl. 427-53.100.
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.
Engelskirchen, Jurgen, to Blohm & Voss AG. Permanent anchoring arrangement for floating structures. 4,637,336, Cl. 114-293.000.
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Olsen, Joseph C.; and Steinbach, Richard H., 4,637,288, Cl. 83-375.000.
England, John R.; and Riach, Richard L., to Inco Limited. In-the-hole drill. 4,637,475, Cl. 173-43.000.
Engler, Philip J.: *See*—
Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., 4,638,131, Cl. 200-61.550.
English, Lawrence J.: *See*—
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., 4,637,075, Cl. 2-94.000.
ENI-Ente Nazionale Idrocarburi: *See*—
Verdini, Antonio S.; and Viscomi, Giuseppe C., 4,638,046, Cl. 530-332.000.
Enomiya, Takuji: *See*—
Nakai, Mamoru; and Enomiya, Takuji, 4,638,094, Cl. 568-309.000.
Enron Corp.: *See*—
Grose, Ronald D., 4,637,219, Cl. 62-199.000.
Nichols, Leo F., 4,638,286, Cl. 338-34.000.
Enterprise Brass Works, Inc.: *See*—
Klop, Elmer P., 4,637,522, Cl. 220-322.000.
Environmental Air Control, Inc.: *See*—
Shields, William, 4,637,301, Cl. 98-115.300.
Epoxy Technology, Inc.: *See*—
Banfield, Charles E., 4,637,197, Cl. 53-428.000.

Epps, Leon A.: *See—*
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.

Epstein, Peter C.: *See—*
Maurer, Robert; and Epstein, Peter C., 4,637,244, Cl. 73-3.000.

Erbert, Virgil, to Illuminated Data, Inc. Methods and apparatus relating to photovoltaic semiconductor devices. 4,638,110, Cl. 136-246.000.

Erdman, David M., to General Electric Company. Method of establishing a preferred rate of air flow, method of determining torque, and apparatus. 4,638,233, Cl. 318-644.000.

Erect-A-Tube, Inc.: *See—*
McQueen, Coy E.; Twedt, Lynn O.; and Thurnau, Edwin H., 4,637,446, Cl. 160-207.000.

Eriksson, Sven-Goran. Device for lifting and handling objects. 4,637,645, Cl. 294-104.000.

Essef Corporation: *See—*
Chirdon, Charles P., 4,637,435, Cl. 138-30.000.

Essex Group, Inc.: *See—*
Sklarski, Dennis J., 4,637,852, Cl. 156-307.400.

Esso Resources Canada Limited: *See—*
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Etablissement Public de Diffusion Dit "Teledifusion de France" : *See—*
Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, 4,638,167, Cl. 250-551.000.

Eto, Kunihiko; Iwashita, Shigeo; and Matsumoto, Tsutomu, to Toyoda Koki Kabushiki Kaisha. Steering characteristic controller for a power steering system. 4,637,483, Cl. 180-142.000.

Evans, Gary E., to Westinghouse Electric Corp. Orthogonal beam forming network. 4,638,317, Cl. 342-373.000.

Evans, Robert D.; and Blezard, Robert C. Tufted weatherstripping with barrier fin. 4,637,948, Cl. 428-89.000.

Exxon Production Research Co.: *See—*
Adorjan, Alexander S., 4,637,637, Cl. 285-47.000.

Exxon Research and Engineering Company: *See—*
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,870, Cl. 208-112.000.
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,637,871, Cl. 208-112.000.
Bouboulis, Constantine J., 4,638,031, Cl. 524-773.000.
Brois, Stanley J.; and Gutierrez, Antonio, 4,637,886, Cl. 252-51.50A.
Grimes, Patrick G., 4,637,968, Cl. 429-105.000.
Osman, Robert M.; and Shulik, Larry J., 4,637,918, Cl. 422-148.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,637,882, Cl. 252-8.514.
Pieters, Wim J. M.; and Okumura, Yoshiharu, 4,638,106, Cl. 585-640.000.

Faber, Johannes W.: *See—*
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., 4,637,777, Cl. 414-751.000.

Factory-Mutual Research Corporation: *See—*
de Ris, John; and Markstein, George H., 4,637,735, Cl. 374-8.000.

Fantucci, Mario: *See—*
Chiarino, Dario; Carenzi, Angelo; Della Bella, Davide; and Fantucci, Mario, 4,638,003, Cl. 514-255.000.

Fanuc Ltd.: *See—*
Nakashima, Seiichiro; Toyoda, Kenichi; Torii, Nobutoshi; and Nihei, Ryo, 4,637,773, Cl. 414-732.000.
Yamazaki, Etuo, 4,638,455, Cl. 364-900.000.

Fanuc Ltd: *See—*
Obara, Haruki; and Aso, Toshiyuki, 4,638,140, Cl. 219-69.00W.

Fastenau, Werner, to Ed. Zublin Aktiengesellschaft. Form for producing concrete rails. 4,637,586, Cl. 249-159.000.

Fauvet, Jean-Pierre; and Parisel, Jacques, to La Telemecanique Electrique. Process and device for determining the mean value of the current delivered by a controllable valve rectifier bridge. 4,638,419, Cl. 363-87.000.

Fechant, Louis: *See—*
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.

Fedeli, Luisa. Grass shaving machine. 4,637,203, Cl. 56-202.000.

Federal Pioneer Limited: *See—*
MacPhee, Colin A. A.; and Yoon, Ohjhong, 4,638,245, Cl. 324-51.000.

Feigel, Josef, to Standard Elektrik Lorenz Aktiengesellschaft. Electronically commutated dc motor. 4,638,201, Cl. 310-216.000.

Feinberg, Andrew S. Swimming pool cleaner attachment. 4,637,087, Cl. 15-1.700.

Feiner, Haim: *See—*
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.

Felcht, Utz-Hellmuth: *See—*
Brandt, Lothar; and Felcht, Utz-Hellmuth, 4,638,058, Cl. 536-103.000.

Fell, Ferol S.: *See—*
Guinn, Ronald K.; and Fell, Ferol S., 4,637,406, Cl. 130-27.00R.

Feng, I-an, to Xerox Corporation. Thermal printing circuit. 4,638,333, Cl. 346-76.0PH.

Feniou, Claude; and Descas, Patrick, to Societe Corial, S.A. Method of producing the p-chlorophenol ester of p-chlorophenoxyisobutyric acid. 4,638,082, Cl. 560-62.000.

Ferag AG: *See—*
Gerber, Walter, 4,637,198, Cl. 53-430.000.

Fernandez, Emilio A., to Pulse Electronics, Inc. Battery condition indicator. 4,638,237, Cl. 320-48.000.

Fernwerktechnik Schleicher & Co.: *See—*
Goldhammer, Albert, 4,637,560, Cl. 241-100.000.

Ferranti plc: *See—*
Brignall, Nicolas L., 4,638,221, Cl. 318-48.000.
Waterworth, John R., 4,638,454, Cl. 364-900.000.

Fetzer, Gerhard: *See—*
Griesinger, Rolf; and Fetzer, Gerhard, 4,637,172, Cl. 51-289.00R.

Fichtel & Sachs AG: *See—*
Gobel, Hilmar; and Raab, Harald, 4,637,500, Cl. 192-3.280.

Fiedler, Leslie C. Actuator with osmotic pressure actuation. 4,637,101, Cl. 24-602.000.

Fieldcrest Mills, Inc.: *See—*
Czelusniak, Paul A., Jr., 4,637,329, Cl. 112-80.450.

Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., to Standard Oil Company (Indiana). Disubstituted maleic anhydride compounds. 4,638,072, Cl. 549-234.000.

Finaurini, Roberto: *See—*
Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, 4,638,465, Cl. 365-228.000.

Finkbeiner, Werner; and Schorn, Franz, to Hans Grohe GmbH & Co. KG. Water jet aeration for sanitary fittings and the like. 4,637,552, Cl. 239-428.500.

Finke, Paul E.: *See—*
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Fiori, David, Jr., to Sensor Technologies, Inc. Sensor apparatus. 4,637,265, Cl. 73-862.330.

FIP Industriale S.p.A.: *See—*
Medeot, Renzo, 4,637,656, Cl. 299-1.000.

Firestone, Raymond A.: *See—*
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Fiscint, Inc.: *See—*
Shen-Orr, Chaim D.; and Berg, Eitan, 4,638,250, Cl. 324-207.000.

Fisher, Dennis: *See—*
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.

Fisher, George A.: *See—*
Baumgartner, Richard A.; Dukes, John N.; and Fisher, George A., 4,638,191, Cl. 307-602.000.

Fishkind, Gregory A.: *See—*
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, 4,638,399, Cl. 361-220.000.

Fitzpatrick, Mark: *See—*
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, 4,638,189, Cl. 307-465.000.

Flamholz, Alexander L., to International Business Machines Corporation. Inspection system for pellicalized reticles. 4,637,714, Cl. 355-77.000.

Flatley, Doris W.; and Hsu, Sheng T., to RCA Corporation. Profile control of boron implant. 4,637,836, Cl. 148-1.500.

Fling, Russell T.: *See—*
Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., 4,638,360, Cl. 358-148.000.

Flood, William H.: *See—*
Schultz, William C., 4,637,801, Cl. 440-67.000.

Foglesonger, John D.; and Vranson, David M., to ITT Corporation. Waveguide assembly. 4,638,273, Cl. 333-254.000.

Foley, Geoffrey M. T., to Xerox Corporation. Self-biased scorotron and control therefor. 4,638,397, Cl. 361-212.000.

Fonda, Carlo L., to Videocolor. Shadow mask for a color image tube and image tube comprising the same. 4,638,211, Cl. 313-405.000.

Fontaine, John M.: *See—*
McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., 4,638,261, Cl. 330-277.000.

Ford Motor Company: *See—*
Pakula, Benjamin J., 4,637,351, Cl. 123-25.00J.
Puscasu, Boris, 4,638,291, Cl. 340-59.000.
Vanselous, Joseph S., 4,63[illegible],281, Cl. 74-869.000.

Foreman, Howard R. Holder for shotgun pattern paper. 4,637,615, Cl. 273-407.000.

Forgac, John M.; and Hoekstra, George R., to Amoco Corporation; and Chevron U.S.A., Inc. In situ retorting of oil shale with pulsed water purge. 4,637,464, Cl. 166-261.000.

Forge, Charles O., to Boschert Inc. Apparatus for maintaining constant frequency in a DC to square wave inverter. 4,638,420, Cl. 363-132.000.

Fortney, Joe L., to Peerless Machine & Tool Corporation. Container die system. 4,637,811, Cl. 493-167.000.

Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., to Foss, Janet Mary Penrose. Portable, foldable and convertible luggage trolley. 4,637,626, Cl. 280-655.000.

Foss, Janet Mary Penrose: *See—*
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.

Foss, John: *See—*
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.

Foster, Peter R., to National Research Development Corporation. Method of extracting cryoprecipitate from frozen blood plasma. 4,638,048, Cl. 530-380.000.

Fotheringham, James R.; and Morrow, David L., to Caterpillar Industrial Inc. Axle assembly. 4,637,488, Cl. 180-253.000.

Fouche, Claude: *See—*
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, 4,638,370, Cl. 358-293.000.

Fouquet, Gerd: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.
Fourche, Jean P.: *See*—
Rousseau, Jean; and Fourche, Jean P., 4,637,803, Cl. 445-23.000.
Fournier, Jeffrey: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., to Aeroquip Corporation. Push-in connect fitting. 4,637,640, Cl. 285-319.000.
Fourrey, Francois; and Caburet, Pierre, to Cycles Peugeot. Adjustable head-rest for a motor vehicle seat or the like. 4,637,655, Cl. 297-410.000.
Fox, Jeffrey R.: *See*—
Blank, Hans G.; and Fox, Jeffrey R., 4,638,246, Cl. 324-73.00R.
Fox, Leo E.: *See*—
Mogol, Gerald M.; and Fox, Leo E., 4,637,372, Cl. 126-127.000.
Framatome & Cie: *See*—
Huet, Yves; and Perichon, Christian, 4,637,294, Cl. 91-536.000.
Francis, Samuel A., to Raytheon Company. Polymer hydrophone array with multilayer printed circuit wiring. 4,638,468, Cl. 367-153.000.
Frank, Arthur M.; DeRespinis, Silvio F.; and Mockovciak, John, Jr., to United States of America, National Aeronautics and Space Administration. Sun shield. 4,637,447, Cl. 160-265.000.
Frank, Earl E., to Abex Corporation. Railroad frog having movable wing rails. 4,637,578, Cl. 246-391.000.
Frank, William E.: *See*—
Ross, John; and Frank, William E., 4,638,138, Cl. 219-10.770.
Franken, Adrianus J. J.: *See*—
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., 4,637,777, Cl. 414-751.000.
Franken, Ronald L.: *See*—
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Frankenbush, Robert H.: *See*—
Hallenbeck, Mark; and Frankenbush, Robert H., 4,637,564, Cl. 242-25.00A.
Frantz, Douglas C.: *See*—
Killen, H. Rcn; Wilkins, Scott A.; and Frantz, Douglas C., 4,637,361, Cl. 123-339.000.
Fraze, Ermal C.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.
Frederickson, James R., to United States of America, Energy. Fabrication of high exposure nuclear fuel pellets. 4,637,900, Cl. 252-643.000.
Freed, Meier E.: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,638,008, Cl. 514-411.000.
Freeman, Herbert J., to Progressive Tool & Industries Company. Apparatus for assembling radiator components. 4,637,133, Cl. 29-727.000.
Freeman, Michael H., to Pilkington P.E. Limited. Multifocal contact lenses utilizing diffraction and refraction. 4,637,697, Cl. 351-161.000.
Freeman, Thomas R.: *See*—
Camden, Thomas M., Jr.; and Freeman, Thomas R., 4,637,915, Cl. 376-435.000.
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., to International Business Machines Corporation. Space charge modulation device. 4,638,342, Cl. 357-15.000.
Frew, Paul C.: *See*—
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., 4,638,396, Cl. 361-101.000.
Frey, Alexander H., to International Business Machines Corporation. Multiplier architecture. 4,638,449, Cl. 364-760.000.
Frezza, William A., to General Instrument Corporation. Apparatus and method for restricting access to a communication network. 4,638,356, Cl. 358-118.000.
Fried, Herbert E., to Shell Oil Company. Preparation of secondary thiols. 4,638,093, Cl. 568-73.000.
Friedrich Deckel Aktiengesellschaft: *See*—
Geiger, Michael, 4,637,120, Cl. 29-568.000.
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., to General Electric Company. Exothermically assisted electric fuse. 4,638,283, Cl. 337-162.000.
Fritz, David P.: *See*—
Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., 4,637,201, Cl. 56-16.400.
Fritz, Harald; and Wurll, Peter, to Siemens Aktiengesellschaft. Multicomponent force and torque measurement cell with strain gauges. 4,637,263, Cl. 73-862.040.
Froening, Helmut; and Basyouni, Mohamed, to Hochtemperatur-Reaktorbau GmbH. Construction for fastening parts to a concrete wall. 4,637,175, Cl. 52-27.000.
Fry, John A.; and Robinson, Douglas B. Fishing simulator. 4,637,603, Cl. 272-1.00R.
FTS Equipment Manufacturing Co.: *See*—
Hallenbeck, Mark; and Frankenbush, Robert H., 4,637,564, Cl. 242-25.00A.
Fuhrman, Ari, to Color Optics, Ltd. Method of pigmenting water-absorbable plastic and products therefrom. 4,638,025, Cl. 524-40.000.
Fuji Photo Film Co., Ltd.: *See*—
Hirai, Hiroyuki; and Kawata, Ken, 4,637,902, Cl. 260-545.00R.
Horikawa, Kazuo; and Ohara, Yuji, 4,638,156, Cl. 250-235.000.
Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, 4,637,975, Cl. 430-353.000.
Kubota, Kazufumi, 4,638,170, Cl. 250-566.000.
Oishi, Kengo; and Suzuki, Osamu, 4,638,393, Cl. 360-132.000.
Ono, Minoru; and Makino, Teruyoshi, 4,637,703, Cl. 354-276.000.
Tanaka, Hirosi; and Saito, Tokukazu, 4,638,162, Cl. 250-327.200.
Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, 4,637,567, Cl. 242-56.00R.
Fuji Xerox Co., Ltd.: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.
Shirai, Masaharu, 4,637,709, Cl. 355-3.00R.
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, to Nihon Parkerizing Co., Ltd. Coated aluminum-zinc alloy plated sheet steel. 4,637,840, Cl. 148-6.200.
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, to Matsushita Electronics Corporation. Method for manufacturing a plastic encapsulated semiconductor device and a lead frame therefor. 4,637,130, Cl. 29-588.000.
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Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.
Fujii, Teruo; and Tsutsui, Tomikazu, to Dainippon Screen Mfg. Co., Ltd. Drum type image scanning and recording apparatus. 4,637,710, Cl. 355-72.000.
Fujimori, Hiroyoshi: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,638,353, Cl. 358-98.000.
Fujimoto, Takahiko: *See*—
Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, 4,637,453, Cl. 164-468.000.
Fujino, Motoaki: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.
Fujino, Yukio: *See*—
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Fujirex Company, Ltd.: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, to Fujirex Company, Ltd. Process for rolling a drum with a photosensitive film. 4,637,711, Cl. 355-72.000.
Fujise, Masayuki: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.
Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, to TDK Electronics Co., Ltd. Piezo-electric transducer. 4,638,205, Cl. 310-312.000.
Fujita, Hiroshi: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,637,927, Cl. 423-644.000.
Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, to Kawasaki Jukogyo Kabushiki Kaisha. Method and apparatus for assembling a structure composing a vehicle's body and the like. 4,637,540, Cl. 228-49.200.
Fujitsu Limited: *See*—
Aizaki, Yoshihiko, 4,638,434, Cl. 364-401.000.
Fukumoto, Toshio, 4,638,466, Cl. 365-230.000.
Motoki, Yasunari; and Ohkuma, Yuji, 4,637,146, Cl. 34-58.000.
Shinoda, Tsutae; and Niinuma, Atsuo, 4,638,218, Cl. 315-169.400.
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, to Nippondenso Co., Ltd. Refrigerator for vehicle. 4,637,222, Cl. 62-244.000.
Fujiyama, Yasutomo: *See*—
Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, 4,637,342, Cl. 118-719.000.
Fukayama, Yukio, to Babcock-Hitachi Kabushiki Kaisha. Apparatus for controlling starting operation of boiler. 4,637,348, Cl. 122-406.0ST.
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Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.
Fukuda Denshi Co., Ltd.: *See*—
Asai, Toshio; and Nakaya, Yasuhiro, 4,637,399, Cl. 128-639.000.
Fukuda, Masuo, to Sankei Giken Kogyo Kabushiki Kaisha. Muffler for internal combustion engine and method of manufacturing tubes for use therein. 4,637,491, Cl. 181-265.000.
Fukuda, Noriyoshi; and Nagasawa, Ken, to Kawasaki Steel Corporation. Method of producing carbon materials. 4,637,906, Cl. 264-29.100.
Fukuda, Tsuguo; and Terashima, Kazutaka, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Method for producing GaAs single crystal. 4,637,854, Cl. 156-607.000.
Fukui, Tetsu: *See*—
Hasegawa, Shigekazu; and Fukui, Tetsu, 4,637,269, Cl. 74-335.000.
Fukumoto, Toshio, to Fujitsu Limited. Programmable semiconductor memory device having separate read word line drivers and write-only word line drivers. 4,638,466, Cl. 365-230.000.
Fuller, Robert J.: *See*—
Yeh, Lun-Shu R.; Grenness, Morten; and Fuller, Robert J., 4,637,970, Cl. 429-153.000.

Funato, Hiroyoshi, to Ricoh Company, Ltd. Multibeam photoscanner. 4,637,679, Cl. 350-6.500.
Furness, Duncan S.: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,638,384, Cl. 360-77.000.
Furuhashi, Tomio: *See*—
Sugiyama, Kiyoshi; and Furuhashi, Tomio, 4,637,118, Cl. 29-563.000.
Furuichi, Akira; and Iijima, Akira, to Tokushu Kika Kogyo Kabushiki Kaisha. Circulation type homogenizing apparatus. 4,637,555, Cl. 241-46.020.
Furze, Paul: *See*—
Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, 4,637,856, Cl. 156-637.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, 4,638,421, Cl. 364-167.000.
Futterknecht, Fritz: *See*—
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, 4,637,827, Cl. 65-235.000.
Gaddi, Bruno, to Piaggio & C. S.p.A. Device for controlling the regulation in an automatic transmission. 4,637,277, Cl. 74-865.000.
Gaffney, Richard W.: *See*—
Bunting, Franklin O.; and Hudson, J. Russell, 4,637,647, Cl. 296-24.00R.
Gaibotti, Maurizio: *See*—
Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, 4,638,465, Cl. 365-228.000.
Gajary, Antal: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.
Games, John E.: *See*—
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Gans, Michael J.: *See*—
Acampora, Anthony; and Gans, Michael J., 4,638,476, Cl. 370-83.000.
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., to Garid, Inc. Glucose medical monitoring system. 4,637,403, Cl. 128-770.000.
Gardner, David L., to Battelle Corporation. Process of preparing microcapsules of lactides or lactide copolymers with glycolides and/or ε-caprolactones. 4,637,905, Cl. 264-4.300.
Garid, Inc.: *See*—
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Garvin, Stacy J.: *See*—
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Gash, Bruce W., to Standard Oil Company. Removal of phenols in groundwater after underground gasification of coal. 4,637,465, Cl. 166-261.000.
Gassmann, Max, to L'Oreal. Method and device for the detection of the position of objects stacked on pallets. 4,638,171, Cl. 250-566.000.
Gaster, Laramie M.; and Orlek, Barry S., to Beecham Group p.l.c. Indeno and benzoquinoxaline. 4,638,066, Cl. 544-344.000.
Gates Energy Products, Inc.: *See*—
Uba, Toshio; and Nelson, Robert F., 4,637,966, Cl. 429-57.000.
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, to Pitney Bowes Inc. Document guide apparatus for preventing jams. 4,637,602, Cl. 271-238.000.
Gavory, Daniel: *See*—
Sambuis, Bernard; and Gavory, Daniel, 4,638,026, Cl. 524-98.000.
Gay, Robert R., to Atlantic Richfield Company. Thin film solar cell module. 4,638,111, Cl. 136-249.000.
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, to Monolithic Memories, Incorporated. Fast and gate with programmable output polarity. 4,638,189, Cl. 307-465.000.
Geiger, Michael, to Friedrich Deckel Aktiengesellschaft. Device for changing of tools or the like into the work spindle of a machine tool. 4,637,120, Cl. 29-568.000.
Geller, Richard: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
Gellermann, Werner; Yang, Yihong; and Luty, Fritz, to University of Utah. Solid state vibrational lasers using F-center/molecular-defect pairs in alkali halides. 4,638,485, Cl. 372-42.000.
Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft". Light box for providing a background illumination having brightness values locally adjusted to the density of a transparency to be viewed by means of the light box. 4,637,150, Cl. 40-361.000.
Gemma, Hideaki; and Hino, Masafumi, to Hitachi, Ltd. Polling control method and system. 4,638,428, Cl. 364-200.000.
General Electric Company: *See*—
Beers, William W.; and Parham, Thomas G., 4,638,214, Cl. 313-487.000.
Beutel, Robert C., 4,638,220, Cl. 315-411.000.
Boutni, Omar M.; and Liu, Ping Y., 4,638,033, Cl. 525-67.000.
Bradshaw, Kenneth M., 4,638,252, Cl. 324-318.000.
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.
Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., 4,638,077, Cl. 558-281.000.
Eberhard, Jeffrey W.; and Cain, Dallas E., 4,638,499, Cl. 378-7.000.
Erdman, David M., 4,638,233, Cl. 318-644.000.
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.
Haim, Elias S.; and Albert, Richard, 4,637,687, Cl. 350-335.000.
Howell, Edward K., 4,638,244, Cl. 324-51.000.
Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., 4,638,190, Cl. 307-512.000.
Jaskolski, Patrick L.; and Eash, Matthew G., 4,638,253, Cl. 324-318.000.
Mark, Victor; and Hedges, Charles V., 4,638,027, Cl. 524-157.000.
Mark, Victor; and Hedges, Charles V., 4,638,036, Cl. 525-462.000.
McMillan, Stephen L.; Akers, Alvin; and Toma, Daniel N., 4,637,231, Cl. 68-4.000.
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Roberts, Gerald L., 4,637,230, Cl. 68-4.000.
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Thompson, Robert A.; and White, Robert S., 4,637,248, Cl. 73-37.500.
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General Electric Company, p.l.c., The: *See*—
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.
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Levinson, Lionel M., 4,638,284, Cl. 338-21.000.
General Foods Corporation: *See*—
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,638,071, Cl. 549-88.000.
General Instrument Corporation: *See*—
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General Motors Corporation: *See*—
Eesley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., 4,637,862, Cl. 204-15.000.
Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., 4,638,131, Cl. 200-61.550.
Sutton, Stephen J., 4,638,305, Cl. 340-620.000.
General Signal Corporation: *See*—
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Genetics Institute, Inc.: *See*—
Benner, Steven A., 4,638,032, Cl. 525-54.110.
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Miller, Donald E., 4,637,307, Cl. 101-93.040.
George, Flint R., to Halliburton Company. Gravity oriented perforating gun for use in slanted boreholes. 4,637,478, Cl. 175-4.510.
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Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.
Gerard, Catier: *See*—
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Gerber, Walter, to Ferag AG. Method and apparatus for temporarily storing printed products arriving in an imbricated formation. 4,637,198, Cl. 53-430.000.
Gerety, Eugene P., to ITT Corporation. Apparatus for providing masterless collision detection. 4,638,311, Cl 340-825.060.
Gernhardt, Mark G.: *See*—
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Gessa, Gianluigi: *See*—
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Gessman, Lawrence J. Method and apparatus for converting a catheter to a cardiac pacing electrode. 4,637,404, Cl. 128-786.000.
Gibbon, Linda M.; and Gibbon, Randolph H. Collector's auction game. 4,637,614, Cl. 273-271.000.
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Gibbon, Linda M.; and Gibbon, Randolph H., 4,637,614, Cl. 273-271.000.
Gill, Frederick A.; and Tocci, Mario P., to Manville Sales Corporation. Fibrous mat facer with improved strike-through resistance. 4,637,951, Cl. 428-215.000.
Gillard, Clive H.: *See*—
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Hennebert, Pierre; Gillard, Jean; and Roland, Michel, 4,637,916, Cl. 422-36.000.
Gillbrand, Per Sune; and Johansson, Sven H., to Saab-Scania Aktiebolag. Ignition system for an Otto-type four-stroke engine. 4,637,368, Cl. 123-647.000.
Gillet, Claude L.: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.
Gillet, Guy, to Automobiles Peugeot; and Automobiles Citroen. Pedal carrier, in particular for a clutch and brake, on a motor vehicle. 4,637,741, Cl. 384-428.000.
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., to Reynolds Metals Company. Can end tester. 4,637,260, Cl. 73-826.000.
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Giocastro, Joseph; and Giocastro, Salvatore. Flexible universal gear box system with yokes. 4,637,271, Cl. 74-386.000.
Giocastro, Salvatore: *See*—
Giocastro, Joseph; and Giocastro, Salvatore, 4,637,271, Cl. 74-386.000.
Giorgio, Giancarlo; and Parmigiani, Bruno, to Societa' Cavi Pirelli S.p.A. Stop joint for interconnecting two electrical cables of different types. 4,638,112, Cl. 174-22.00R.
Girard, Francois: *See*—
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Gladh, Goran: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.
Glaister, Frank J., to High Voltage Engineering Corporation. Wire insulated with a fluorocarbon polymer composition. 4,637,955, Cl. 428-379.000.
Glasow, Peter; and Ruhle, Wolfgang, to Siemens Aktiengesellschaft. Detector apparatus and method for computer tomography and radiography. 4,638,165, Cl. 250-370.000.
Glime, Fred W. Pivotal motor mount. 4,637,332, Cl. 114-61.000.
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, to Standard Oil Company, The. Dual ion beam deposition of amorphous semiconductor films. 4,637,869, Cl. 204-192.110.
GMF Robotics Corporation: *See*—
Akeel, Hadi A., 4,638,143, Cl. 215-121.0LQ.
GMN Georg Muller Nurnberg GmbH: *See*—
Petermann, Harald; and Bauer, Peter, 4,637,369, Cl. 125-15.000.
Gobel, Hilmar; and Raab, Harald, to Fichtel & Sachs AG. Hydrodynamic coupling with serially arranged damper units. 4,637,500, Cl. 192-3.280.
Gockel, Gary L.: *See*—
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Gogniat, Paul, to Montres Rado S.A. Watch case. 4,637,734, Cl. 368-294.000.
Goldenfeld, Iliya, to Kibbutz Gordonia Hulda. Auxiliary drive for pedal-driven road vehicles. 4,637,274, Cl. 74-625.000.
Goldhammer, Albert, to Fernwerktechnik Schleicher & Co. Machine for comminuting materials, such as documents particularly a shredding machine. 4,637,560, Cl. 241-100.000.
Goldstein, Gideon: *See*—
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Gomersall, Rodney. Inlet and outlet valves. 4,637,441, Cl. 141-349.000.
Goode, John. Swimming pool vacuum cleaner. 4,637,086, Cl. 15-1.700.
Goodman, Joseph R.: *See*—
Coller, James R.; Coon, Paul A.; and Goodman, Joseph R., 4,637,670, Cl. 339-46.000.
Goodwin, Vernon L., to Support Systems International, Inc. Fluidized patient support apparatus. 4,637,083, Cl. 5-453.000.
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Gordon, Eric M.: *See*—
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Gordon, Eugene I., to AT&T Bell Laboratories. High power, broad area, monochromatic light source. 4,637,685, Cl. 350-96.200.
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Minten, Karl; and Krug, William, 4,637,987, Cl. 436-151.000.
Gower, David I. Railroad spike resinstallation apparatus. 4,637,314, Cl. 104-17.100.
Grabbe, Dimitry G., to AMP Incorporated. Method for mounting a connector to a substrate. 4,637,135, Cl. 29-832.000.
Grable, Donovan B. Liquid mud ring control of underground liquids. 4,637,462, Cl. 166-245.000.
Grabley, Susanne, to Hoechst Aktiengesellschaft. Process for the racemization of optically active aminoacids. 4,638,086, Cl. 562-401.000.
Graf, Jerry A.: *See*—
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Graham, Merton J.; and Miller, Paul H. Two stage chuck. 4,637,620, Cl. 279-1.0DA.
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, to Motorola, Inc. Signal processing unit. 4,638,453, Cl. 364-900.000.
Grant, Ross M.: *See*—
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., 4,638,175, Cl. 307-64.000.
Grawi, Robert S. Variable pitch harp. 4,637,290, Cl. 84-173.000.
Gray, David K. Pneumatic gas cylinder valve actuator. 4,637,423, Cl. 137-382.500.
Gray, Frank; and Hardin, Clyde M., Jr. Method of making clear dies from bar stock. 4,637,282, Cl. 76-4.000.
Gray, Robert R.; and Marguth, Val M. Pulse combustion drying apparatus for particulate materials. 4,637,794, Cl. 432-58.000.
Grayden, Paul A., to Prescant Pty. Limited. Water ring vacuum pump having adjustable part plates and a hollow impeller. 4,637,780, Cl. 417-68.000.
Great Lakes Chemical Corporation: *See*—
Sergent, Rodney H.; and Thanstrom, Kenneth N., 4,637,865, Cl. 204-111.000.
Greatbatch Enterprises, Inc.: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.
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Green, Marion A. Steam boosted internal combustion engine. 4,637,352, Cl. 123-25.00P.
Green, Sidney J.: *See*—
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Greenwood, Arthur R., to UOP Inc. Process for sampling particulate matter passing from one treatment zone to another. 4,637,266, Cl. 73-863.860.
Greger, Wolfgang, to Sulzer Brothers Limited. Brake for a weaving machine. 4,637,437, Cl. 139-336.000.
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Griesinger, Rolf; and Fetzer, Gerhard, to Spindelfabrik Sussen, Schurr, Stahlecker. Method and apparatus for treating open-end friction spinning rollers. 4,637,172, Cl. 51-289.00R.
Griffin, William R.; Heller, Lawrence G.; and Horowitz, Peter N., to International Business Machines Corporation. Random logic error detecting system for differential logic networks. 4,638,482, Cl. 371-63.000.
Griffith, Carroll L.; and Nielson, Albert E., to Griffith Laboratories U.S.A., Inc. Method and composition for smoking comestible products and smoked products produced therewith. 4,637,305, Cl. 99-481.000.
Griffith Laboratories U.S.A., Inc.: *See*—
Griffith, Carroll L.; and Nielson, Albert E., 4,637,305, Cl. 99-481.000.
Grimes, Patrick G., to Exxon Research and Engineering Company. Solid bromine complexers. 4,637,968, Cl. 429-105.000.
Grimshaw, Scott F.: *See*—
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, 4,637,869, Cl. 204-192.110.
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Smith, Harry D., Jr.; and Verbout, Jerry L., 4,638,161, Cl. 250-269.000.
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Hartmann, Wilhelm U.; and Martin, James A., to HR Textron Inc. Filter disc. 4,637,877, Cl. 210-347.000.

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Hisamoto, Iwao; Maeda, Chiaki; and Nishiwaki, Mitsuhiro, to Daikin Kogyo Co., Ltd. Fluorine-containing quaternary ammonium compounds and their production. 4,638,089, Cl. 564-292.000.

Hiscock, David G.: *See*—
Harper, Stephen; and Hiscock, David G., 4,637,860, Cl. 162-117.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Yoshimura, Yasuo; Yamauchi, Kunio; and Saito, Kenji, 4,638,366, Cl. 358-228.000.

Hitachi Koki Co., Ltd.: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Hitachi, Ltd.: *See*—
Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, 4,638,403, Cl. 361-341.000.
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, 4,638,438, Cl. 364-449.000.
Gemma, Hideaki; and Hino, Masafumi, 4,638,428, Cl. 364-200.000.
Horibe, Youshun; Ohshima, Yoshikuni; and Masuda, Toyohiko, 4,637,350, Cl. 122-441.000.
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.
Komatsu, Shigeru; and Kawata, Keiji, 4,638,497, Cl. 375-116.000.
Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, 4,638,308, Cl. 340-736.000.
Matsumoto, Tetsuro, 4,638,460, Cl. 365-149.000.
Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, 4,638,225, Cl. 318-341.000.
Noda, Masaru; and Shiga, Toshihiro, 4,638,352, Cl. 358-44.000.
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.
Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, 4,638,477, Cl. 370-94.000.
Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, 4,637,124, Cl. 29-571.000.
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.
Teshima, Tsunehiko, 4,638,379, Cl. 360-19.100.
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.
Watabe, Masaya; and Abe, Shuichi, 4,638,429, Cl. 364-200.000.
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Hitachi Seiko Ltd.: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Hitachi Video Engineering, Ltd.: *See*—
Komatsu, Shigeru; and Kawata, Keiji, 4,638,497, Cl. 375-116.000.

Hitler, Gene D.: *See*—
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., 4,638,417, Cl. 363-41.000.

Ho, Chi-Tang: *See*—
Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., 4,638,095, Cl. 568-326.000.

Ho, Shu-Kuang: *See*—
Wang, An; Ho, Shu-Kuang; and Mainemer, Carlos I., 4,638,118, Cl. 178-18.000.

Hochtemperatur-Reaktorbau GmbH: *See*—
Froening, Helmut; and Basyouni, Mohamed, 4,637,175, Cl. 52-27.000.

Hodge, Robert R. Backflow preventing attachment for toilets. 4,637,079, Cl. 4-427.000.

Hoechst Aktiengesellschaft: *See*—
Brandt, Lothar; and Felcht, Utz-Hellmuth, 4,638,058, Cl. 536-103.000.
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,638,063, Cl. 544-2.000.
Grabley, Susanne, 4,638,086, Cl. 562-401.000.
Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, 4,637,828, Cl. 71-76.000.
Thurow, Horst, 4,637,834, Cl. 106-124.000.

Hoechst Aktiengesellschat: *See*—
Heinrich, Rudolf; and Albrecht, Konrad, 4,638,090, Cl. 564-437.000.

Hoechstaktiengesellschaft: *See*—
Neeb, Rudolf; and Mohr, Reinhard, 4,638,053, Cl. 534-589.000.

Hoekstra, George R.: *See*—
Forgac, John M.; and Hoekstra, George R., 4,637,464, Cl. 166-261.000.

Hofmann Werkstatt-Technik GmbH: *See*—
Menigat, Roland; and Gruppenbacher, Klaus, 4,637,171, Cl. 51-281.00R.

Hofmann, Wilfried, to Agfa-Gevaert AG. Cover for vacuum ink printing head. 4,638,336, Cl. 346-140.00R.

Hogan, Lawrence R.: *See*—
Kane, Michael; and Hogan, Lawrence R., 4,637,153, Cl. 40-605.000.

Hoglander, Bjorn: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.

Hohman, Charles M.: *See*—
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,638,490, Cl. 373-35.000.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-428.000.

Holan, Robert J.; and Lindsey, Kelly D. Single gear-pair vehicle differential. 4,637,276, Cl. 74-713.000.

Holden, Stephen: *See*—
Llewellyn, Michael; and Holden, Stephen, 4,637,413, Cl. 134-111.000.

Holder, Donald W.; and Phillips, William R., to United States of America, Army. Electronic image stabilization. 4,637,571, Cl. 244-3.160.

Holland, Frank S., to Manchem Limited. Extraction of tin from its ores. 4,638,074, Cl. 556-98.000.

Hollfritsch, Erich: *See*—
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich, 4,637,184, Cl. 52-220.000.

Hollowell, James A.: *See*—
Henderson, David; Hollowell, James A.; and Woodbury, Howard A., 4,637,313, Cl. 102-398.000.

Holpp, Wolfgang, to Licentia Patent-Verwaltungs-GmbH. Millimeter wave circulator. 4,638,267, Cl. 333-1.100.

Holt, Brian: *See*—
Phillips, Emyr; and Holt, Brian, 4,637,926, Cl. 423-573.00R.

Holz, Peter: *See*—
Donath, Sabine; and Holz, Peter, 4,637,174, Cl. 51-425.000.

Home Box Office, Inc.: *See*—
Heimbach, Paul A., 4,638,357, Cl. 358-121.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hatakeyama, Toshio; and Yoshio, Toshihiko, 4,637,960, Cl. 428-469.000.
Iwai, Kazuhiro, 4,637,486, Cl. 180-225.000.
Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, 4,637,278, Cl. 74-866.000.
Takahashi, Tsuneo; and Otsuka, Hirofumi, 4,637,264, Cl. 73-862.330.
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.
Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, 4,637,293, Cl. 91-507.000.
Yano, Yoshiki; and Oikawa, Toshihiro, 4,637,358, Cl. 123-169.0PA.

Honda Kiken Kogyo Kabushiki Kaisha: *See*—
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,637,362, Cl. 123-478.000.

Honda Lock Manufacturing Co., Ltd.: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.

Honda, Takayasu: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.

Honeywell Inc.: *See*—
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., 4,638,341, Cl. 357-15.000.
Carney, James K.; and Kolbas, Robert M., 4,637,122, Cl. 29-569.00L.
Dietiker, Paul; and Nelson, Marvin D., 4,637,429, Cl. 137-505.140.
Egli, Werner H.; and Weber, Mark W., 4,637,723, Cl. 356-350.000.

Honeywell Information Systems Inc.: *See*—
Stoffers, Brian L., 4,638,450, Cl. 364-715.000.

Hong, Chung-Yieh. Security case used on counter. 4,637,325, Cl. 109-19.000.

Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., to NCR Corporation. Edge triggered clock distribution system. 4,638,256, Cl. 328-105.000.

Honryo, Hatsuo: *See*—
Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, 4,637,567, Cl. 242-56.00R.

Horibe, Youshun; Ohshima, Yoshikuni; and Masuda, Toyohiko, to Hitachi, Ltd. System for recovering drain. 4,637,350, Cl. 122-441.000.

Horigome, Shinkichi: *See*—
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.

Horiguchi, Shojiro: *See*—
Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, 4,638,052, Cl. 534-575.000.

Horikawa, Kazuo; and Ohara, Yuji, to Fuji Photo Film Co., Ltd. Light beam scanning apparatus with adjustable scanning speed and offset. 4,638,156, Cl. 250-235.000.

Horikiri Spring Mfg. Co., Ltd.: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.
Horn, Dieter: *See*—
Auweter, Helmut; Horn, Dieter; and Lueddecke, Erik, 4,637,716, Cl. 356-28.500.
Horn, Richard L.: *See*—
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., 4,638,437, Cl. 364-427.000.
Horowitz, Peter N.: *See*—
Griffin, William R.; Heller, Lawrence G.; and Horowitz, Peter N., 4,638,482, Cl. 371-63.000.
Hosaka, Kenji: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.
Hoshinouchi, Susumu: *See*—
Sakuma, Hisayuki; and Hoshinouchi, Susumu, 4,638,145, Cl. 219-121.0LU.
Hosiden Electronics Co., Ltd.: *See*—
Tajima, Kyousuke, 4,637,669, Cl. 339-14.00R.
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Developer thin layer forming apparatus. 4,637,706, Cl. 355-3.0DD.
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Packaged terminal air-conditioner. 4,637,223, Cl. 62-263.000.
Hostetler, Eldon, to Ziggity Systems, Inc. Watering system for fowl and small animals. 4,637,345, Cl. 119-72.500.
Houlihan, Christopher M.: *See*—
Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., 4,638,095, Cl. 568-326.000.
Houman, Leif; and Wohlabaugh, Leonard M., to Xermac, Inc. Modular EDM system. 4,638,141, Cl. 219-69.00R.
House Food Industrial Company Ltd.: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,637,145, Cl. 34-1.000.
Howell, Edward K., to General Electric Company. Ground connection monitor. 4,638,244, Cl. 324-51.000.
Howell, Richard H.; and MacGovern, Alan J., to Itek Corporation. Shearing interferometer employing an acousto-optic cell. 4,637,724, Cl. 356-353.000.
Howeth, D. Franklin. Filter system for power sweeper. 4,637,825, Cl. 55-302.000.
Howing, Jurgen, to Siemens Aktiengesellschaft. Transposed bar for an electrical machine. 4,638,113, Cl. 174-34.000.
Hoy, Kenneth L.: *See*—
Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., 4,638,029, Cl. 524-430.000.
HR Textron Inc.: *See*—
Hartmann, Wilhelm U.; and Martin, James A., 4,637,877, Cl. 210-347.000.
Hsieh, Robert C., to Xerox Corporation. Edge extraction technique. 4,638,369, Cl. 358-283.000.
Hsu, Sheng T.: *See*—
Flatley, Doris W.; and Hsu, Sheng T., 4,637,836, Cl. 148-1.500.
Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Fluid-operated clutch disengaging apparatus. 4,637,505, Cl. 192-88.00A.
Huber, Robert: *See*—
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, 4,637,827, Cl. 65-235.000.
Hudson, Bertram J.: *See*—
Garcia, Fernando S.; Ginnow-Merkert, Hartmut; Anderson, Paul J.; and Hudson, Bertram J., 4,637,403, Cl. 128-770.000.
Hudson, J. Russell: *See*—
Bunting, Franklin O.; and Hudson, J. Russell, 4,637,647, Cl. 296-24.00R.
Huet, Yves; and Perichon, Christian, to Framatome & Cie. Device for controlling the supply of fluid under pressure to a hydraulic circuit as a function of the state of locking of unlocking of two mechanical members. 4,637,294, Cl. 91-536.000.
Hughes Aircraft Company: *See*—
Eggert, Dennis J.; Hendrix, Charles E.; and Krinsky, Barnet, 4,638,320, Cl. 342-442.000.
Jergenson, Jerg B., 4,638,210, Cl. 313-362.100.
Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., 4,637,678, Cl. 350-3.700.
Rand, Stephen C.; and DeShazer, Larry G., 4,638,484, Cl. 372-42.000.
Wessel, Frank J.; and Hancock, Donald J., 4,638,149, Cl. 219-499.000.
Hughes, David W., to Vetco Offshore, Inc. Subsea control pod valve assembly. 4,637,419, Cl. 137-236.100.
Hughes Tool Company: *See*—
Weathers, Gary G.; and Rice, Billy J., 4,637,470, Cl. 166-344.000.
Hugl, Herbert: *See*—
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, 4,637,979, Cl. 435-19.000.
Hundebol, Keld O., to Udviklingscentret Hansen & Hundebol A/S. Rotating grinding or polishing disc. 4,637,173, Cl. 51-334.000.
Hunn, Kevin W. Jump rope. 4,637,606, Cl. 272-75.000.
Hurditch, Rodney J.: *See*—
Kwak, Won S.; and Hurditch, Rodney J., 4,637,698, Cl. 351-163.000.
Huret et ses Fils: *See*—
Cuvelier, Antoine L.; and Boucher, Guy M. G., 4,638,448, Cl. 364-565.000.
Husain, Abbas. Nail clipper. 4,637,137, Cl. 30-28.000.
Hutchinson, Charles H. Air volume control. 4,637,080, Cl. 4-542.000.
Hutzenlaub, Armin, to Kampf GmbH & Co. Maschinenfabrik. Simultaneous biaxial stretching machine for thermoplastic film webs. 4,637,103, Cl. 26-73.000.
Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., to General Electric Company. Digitally controlled wideband phase shifter. 4,638,190, Cl. 307-512.000.
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., to Coca-Cola Company, The. Monoquaternized pyrazinium compounds and their use as electron carriers in photosynthetic processes. 4,638,005, Cl. 544-336.000.
ICL Scientific Corp.: *See*—
Mitchell, Vance C., 4,637,693, Cl. 350-536.000.
Ide, Jushi: *See*—
Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, 4,638,308, Cl. 340-736.000.
Ide, Toshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Ogawa, Kenji, 4,637,812, Cl. 493-357.000.
Idesawa, Masanori, to Rikagaku Kenkyusho. Optical distance measuring apparatus. 4,637,715, Cl. 356-1.000.
Idstein, Paul H. Food storage device. 4,637,580, Cl. 248-95.000.
Iida, Akinori: *See*—
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.
Iida, Hitoshi; and Nakayama, Ryoichi, to Kabushiki Kaisha Toshiba. Apparatus for moving carriages along ladders. 4,637,494, Cl. 187-10.000.
Iijima, Akira: *See*—
Furuichi, Akira; and Iijima, Akira, 4,637,555, Cl. 241-46.020.
Iiyama, Kiyotaka; and Inaba, Norihiko, to Ricoh Company, Ltd. Two-color thermosensitive recording label. 4,638,340, Cl. 346-204.000.
Iizuka, Akira; Konai, Yutaka; Yamauchi, Takashi; and Hayashi, Shoichiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. 6-substituted naphthalene-2-carboxylic acids and process for producing the same. 4,638,087, Cl. 562-467.000.
Ijiri, Waichiro; and Hirakushi, Shuzo, to Koyo Jidoki Kabushiki Kaisha. Hydraulic control apparatus for a power steering device. 4,637,484, Cl. 180-142.000.
Ikada, Shoji: *See*—
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.
Ikagami, Akira: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.
Ikeda, Hiroshi, to Citizen Watch Co., Ltd. Paper feeder for a printer. 4,637,537, Cl. 226-76.000.
Ikuzawa, Masanori: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.
Illuminated Data, Inc.: *See*—
Erbert, Virgil, 4,638,110, Cl. 136-246.000.
Imai, Keiji: *See*—
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, 4,637,562, Cl. 241-259.200.
Imai, Yoshio, to Nissan Motor Company, Limited; and Sannohashi Seisakusho Company, Limited. Bolt adapted for one-handed tightening by tightening tool. 4,637,764, Cl. 411-5.000.
Imakawa, Kazuhiko: *See*—
Crabtree, Paul J.; and Imakawa, Kazuhiko, 4,637,890, Cl. 252-90.000.
Imes, Clifford W., IV: *See*—
Thompson, Michael D.; and Imes, Clifford W., IV, 4,637,340, Cl. 118-657.000.
IMO AB: *See*—
Segerstrom, Lars H., 4,637,787, Cl. 418-203.000.
Imperial Chemical Industries PLC: *See*—
Bowden, Roy D., 4,638,091, Cl. 564-473.000.
Ward, Mary V.; Nield, Eric; and Staniland, Philip A., 4,638,037, Cl. 525-471.000.
Impink, Albert J., Jr., to Westinghouse Electric Corp. Method and apparatus for continuous on-line synthesis of power distribution in a nuclear reactor core. 4,637,910, Cl. 376-216.000.
Inaba, Norihiko: *See*—
Iiyama, Kiyotaka; and Inaba, Norihiko, 4,638,340, Cl. 346-204.000.
Inami, Yasuhiko; Watanabe, Masanori; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Field effect transistor-type moisture sensor. 4,638,346, Cl. 357-25.000.
Inayashi, Minoru: *See*—
Okura, Masahiko; and Inayashi, Minoru, 4,637,098, Cl. 24-136.00R.
Inco Limited: *See*—
England, John R.; and Riach, Richard L., 4,637,475, Cl. 173-43.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Valle, Franco; and Musso, Pietro, 4,637,744, Cl. 400-185.000.
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., to Med-Vest Inc. Emergency medical services system. 4,637,075, Cl. 2-94.000.

Inoue, Masatoshi: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Inoue, Nobuhiro, to Tachikawa Spring Co., Ltd. Top cover member fixing arrangement in a vehicle seat. 4,637,650, Cl. 297-410.000.

Insituform Holdings Limited: *See*—
Wood, Eric, 4,637,754, Cl. 405-150.000.

Inskip, Ervin B.; and Patane, Joseph M., to Mallinckrodt, Inc. Inhibiting polymerization of ethylenically unsaturated monomers. 4,638,079, Cl. 560-4.000.

Instance, David J. Label in the form of a sheet and envelope. 4,637,633, Cl. 283-81.000.

Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Institut National de la Sante et de la Recherche Medicale: *See*—
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Institute for Gravitational Strain Pathology, Inc.: *See*—
Jungmann, Gertrude, 4,637,381, Cl. 128-80.00G.

Instranetics, Inc.: *See*—
Eldrige, John D., Jr., 4,637,513, Cl. 206-370.000.

Insul Company, Inc.: *See*—
La Bate, Michael D., II; and Perri, Joseph A., 4,637,592, Cl. 266-272.000.

Interlock Structures International, Inc.: *See*—
Lange, Fredric A., 4,637,193, Cl. 52-648.000.

International Business Machines Corporation: *See*—
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.
Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.
Cazcarra, Victor; and LeRoueille, Jocelyne, 4,637,123, Cl. 29-569.00R.
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.
Cranford, Hayden C., Jr.; and Garvin, Stacy J., 4,638,464, Cl. 365-226.000.
Flamholz, Alexander L., 4,637,714, Cl. 355-77.000.
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., 4,638,342, Cl. 357-15.000.
Frey, Alexander H., 4,638,449, Cl. 364-760.000.
Griffin, William R.; Heller, Lawrence G.; and Horowitz, Peter N., 4,638,482, Cl. 371-63.000.
Hartung, Michael H., 4,638,425, Cl. 364-200.000.
Iyer, Subramanian S., 4,638,347, Cl. 357-54.000.
Martin, Daniel B., 4,638,427, Cl. 364-200.000.
Rajeevakumar, Thekkemadathil V.; and Terman, Lewis M., 4,638,462, Cl. 365-203.000.
Rickard, Dale A.; and Rudelis, Glen H., 4,638,183, Cl. 307-291.000.
Rockett, Leonard R., Jr., 4,638,463, Cl. 365-205.000.

International Paper Company: *See*—
Steck, Robert F.; and Baartman, John L., III, 4,637,199, Cl. 53-451.000.

International Standard Electric Company: *See*—
Ayliffe, Peter J., 4,638,310, Cl. 340-805.000.

International Standard Electric Corporation: *See*—
Auch, Wilfried; and Schlemper, Eberhard, 4,638,266, Cl. 332-7.510.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Sidki, Ahmad M.; and Smith, David S., 4,637,985, Cl. 436-518.000.

Inui, Toshiharu: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Inukai, Hiroshi: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, 4,638,041, Cl. 526-247.000.

IRS Industrie Rationalisierungs-Systeme GmbH: *See*—
Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, 4,638,398, Cl. 361-214.000.

Irvine, Thomas F., Jr.; and Park, Noh-Aeok, to State University of New York. Apparatus and method for viscosity measurements for Newtonian and non-Newtonian fluids. 4,637,250, Cl. 73-57.000.

Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, to Mitsubishi Denki Kabushiki Kaisha. Sun light electricity generator. 4,638,109, Cl. 136-244.000.

Ishihata, Takato, to Toyota Jidosha Kabushiki Kaisha. Hose clamping device. 4,637,100, Cl. 24-274.00R.

Ishii Syoji, Ltd.: *See*—
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, 4,637,562, Cl. 241-259.200.

Ishikawa, Junzo: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.

Ishikawa, Takehiro, to Kabushiki Kaisha Daini Seikosha. Integrated circuit for converting a drive signal of three or more voltage levels to two voltage levels. 4,638,247, Cl. 324-73.00R.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Kawane, Minoru, 4,637,617, Cl. 277-150.000.
Tomizawa, Fumio, 4,638,487, Cl. 373-9.000.

Ishimura, Toshihiko; and Maekawa, Yukio, to Minolta Camera Kabushiki Kaisha. Exchangeable lens which exchanges electrical signals with a camera body. 4,637,704, Cl. 354-286.000.

Ishizaki, Morio; and Nishikawa, Akiyoshi, to Ishizaki Press Kogyo Co., Ltd. Battery can hole detecting apparatus. 4,637,249, Cl. 73-41.000.

Ishizaki Press Kogyo Co., Ltd.: *See*—
Ishizaki, Morio; and Nishikawa, Akiyoshi, 4,637,249, Cl. 73-41.000.

Ishizuka, Hiroshi. Rotary saw blade. 4,637,370, Cl. 125-15.000.

Isogai, Tokio: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Itek Corporation: *See*—
Chang, I-Cheng, 4,637,689, Cl. 350-372.000.
Howell, Richard H.; and MacGovern, Alan J., 4,637,724, Cl. 356-353.000.

Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, to Hokuriku Pharmaceutical Co., Ltd. Derivatives of 3-pyrrolidinopropiophenone and a process for preparation thereof. 4,638,009, Cl. 514-428.000.

Ito, Katsumi: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,638,000, Cl. 514-211.000.

Ito, Mitsuko: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Ito, Shintaro: *See*—
Iwasaki, Hiroshi; and Ito, Shintaro, 4,637,125, Cl. 29-571.000.

Ito, Susumo: *See*—
Sawamura, Mitsuharu; and Ito, Susumo, 4,637,953, Cl. 428-333.000.

Itoh, Hiroshi; and Takada, Mitsuru, to Toyota Jidosha Kabushiki Kaisha. Method for controlling a continuously variable transmission. 4,637,279, Cl. 74-866.000.

Itoh, Yasuo, to Kabushiki Kaisha Toshiba. Semiconductor memory address lines with varied interval contact holes. 4,638,458, Cl. 365-51.000.

Itsuki, Fumiaki; and Oku, Seiji, to Omron Tateisi Electronics Co. Reflection-type photoelectric switching apparatus with light-adjustable reference light detection. 4,638,154, Cl. 250-227.000.

ITT Corporation: *See*—
Chalet, Alain R. G., 4,638,474, Cl. 370-60.000.
Foglesonger, John D.; and Vranson, David M., 4,638,273, Cl. 333-254.000.
Gerety, Eugene P., 4,638,311, Cl. 340-825.060.
Hargrave, Franklin; and Middleton, Francisco A., 4,638,124, Cl. 379-159.000.

Ive, Richard A., to Commonwealth of Australia, The. Lossy transmission line using spaced ferrite beads. 4,638,272, Cl. 333-236.000.

Iwado, Shuichi: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.

Iwai, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Air intake system and cooling system relation for three-wheeled motor vehicle with riding saddle. 4,637,486, Cl. 180-225.000.

Iwai, Kenji: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, to Kokusai Denshin Denwa Co., Ltd. Optical fiber with light reflecting particles dispersed through buffer layers to dissipate leaky cladding modes. 4,637,686, Cl. 350-96.290.

Iwanaga, Shoichi: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.

Iwanaka, Masaya; and Kajiwara, Seiji, to Nippon Chem-Con Corp.; and Koide, Hideo. Electroacoustic transducer. 4,637,489, Cl. 181-160.000.

Iwanczuk, Paul: *See*—
Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, 4,637,672, Cl. 339-61.00R.

Iwasaki, Hiroshi; and Ito, Shintaro, to Kabushiki Kaisha Toshiba. Method for making a semiconductor integrated device including bipolar transistor and CMOS transistor. 4,637,125, Cl. 29-571.000.

Iwase, Takatoshi; and Nakagawa, Akira, to Nippondenso Co., Ltd. Apparatus for assembling heat exchanger core. 4,637,132, Cl. 29-726.000.

Iwashita, Shigeo: *See*—
Eto, Kunihiko; Iwashita, Shigeo; and Matsumoto, Tsutomu, 4,637,483, Cl. 180-142.000.

Iwata, Takahiro: *See*—
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,637,362, Cl. 123-478.000.

Iwata, Toshio; and Ueda, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Knock deriving apparatus for internal combustion engines. 4,637,245, Cl. 73-35.000.

Iwatsu Electric Co., Ltd.: *See*—
Kobayashi, Kensuke; and Tazoh, Yasuo, 4,638,185, Cl. 307-352.000.

Iyer, Subramanian S., to International Business Machines Corporation. Gate electrode sidewall isolation spacer for field effect transistors. 4,638,347, Cl. 357-54.000.

Izzi, Lewis B., Sr., to Plastic Oddities Inc. Plastic washing machine box with hinged mounting brackets. 4,637,422, Cl. 137-360.000.

J. H. Benecke GmbH: *See*—
Menze, Kurt, 4,637,104, Cl. 28-283.000.

J. M. Voith GmbH: *See*—
Wohrle, Albert, 4,637,338, Cl. 118-126.000.

Jackson, Gregg B. Sail and sailing rig. 4,637,331, Cl. 114-39.000.

Jackson, John M.: *See*—
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., 4,637,260, Cl. 73-826.000.
Jackson, Thomas N.: *See*—
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., 4,638,342, Cl. 357-15.000.
Jacquot, Claude: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
Jacquot, Jean-Paul; and Guillery, Patrick, to Scandpower, Inc. Device for measuring the power in a nuclear reactor. 4,637,913, Cl. 376-247.000.
Jacuzzi Inc.: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.
Jacuzzi, Roy A.: *See*—
DeSousa, Daniel A.; Gockel, Gary L.; D'Innocente, Ralph; and Jacuzzi, Roy A., 4,637,873, Cl. 210-169.000.
James Howden Australia Pty. Limited: *See*—
Stephenson, Robert G., 4,637,826, Cl. 55-304.000.
James River Corporation: *See*—
Manning, James H.; and Sorenson, Wayne P., 4,637,949, Cl. 428-110.000.
Janatka, Karel: *See*—
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, 4,637,602, Cl. 271-238.000.
Janson, Richard W. Furniture assembly and assembly device. 4,637,324, Cl. 108-111.000.
Jansson, Allan P.: *See*—
Elias, John G.; and Jansson, Allan P., 4,638,456, Cl. 364-518.000.
Jansson, Kurt, to AB A. K. Eriksson. Saw assembly. 4,637,443, Cl. 144-39.000.
Japan Atomic Energy Research Institute: *See*—
Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, 4,637,866, Cl. 204-129.000.
Jaskolski, Patrick L.; and Eash, Matthew G., to General Electric Company. Mutual inductance NMR RF coil matching device. 4,638,253, Cl. 324-318.000.
Jean Walterscheid GmbH: *See*—
Vollmer, Jurgen, 4,637,751, Cl. 403-379.000.
Jeans, Edward L., to Cadbury Schweppes, PLC. Mini-regulator valve assembly. 4,637,439, Cl. 141-18.000.
Jecko, Jean-Rene ; and Motola, Marcel, to Thomson-CSF. Method of incrementally adjusting the center frequency of a microstrip-line printed filter by manuevering dielectric layers. 4,638,271, Cl. 333-205.000.
Jeffrey, Paul W.; and Marchand, Gilles, to Alcan International Limited. Production of aluminum alloy sheet and articles fabricated therefrom. 4,637,842, Cl. 148-12.70A.
Jegousse, Michel: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,638,142, Cl. 219-121.0EC.
Jensen, Garold K. Secure reliable transmitting and receiving system for transfer of digital data. 4,638,496, Cl. 375-104.000.
Jenzsch, Gunter; Rauh, Kurt; and Wegscheider, Hans J., to Mirbeth, Rudolph. Vibratory decoring apparatus for castings. 4,637,558, Cl. 241-79.000.
Jergenson, Jerg B., to Hughes Aircraft Company. Liquid metal ion source. 4,638,210, Cl. 313-362.100.
Jernigan, Edward L.: *See*—
Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, 4,637,856, Cl. 156-637.000.
Jess, Norval M.: *See*—
Gillis, Joseph P.; and Jess, Norval M., 4,637,473, Cl. 169-61.000.
Jiang, Chih-Chang. Dispenser for a liquid container. 4,637,530, Cl. 222-564.000.
Johansson, Sven H.: *See*—
Gillbrand, Per Sune; and Johansson, Sven H., 4,637,368, Cl. 123-647.000.
John Zink Company: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,637,793, Cl. 431-202.000.
Johns Hopkins University, The: *See*—
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.
Johnson, Charles E.; and New, Richard W., to Buffalo Weaving and Belting Company. Longer lasting woven polyaramide belting for high temperature applications. 4,637,511, Cl. 198-846.000.
Johnson, David D.; and Biller, Cleveland J., to United States of America, Agriculture. Auto-release logging choker. 4,637,643, Cl. 294-75.000.
Johnson, Davin W.: *See*—
Hegel, James D.; and Johnson, Davin W., 4,637,907, Cl. 264-45.700.
Johnson, George E.; and Newman, Walter, to Leviton Manufacturing Company, Inc. Theft-resistant device for fluorescent lamp. 4,637,671, Cl. 339-50.00R.
Johnson, Gordon E.: *See*—
Smith, Thomas W.; Ward, Anthony T.; Luca, David J.; and Johnson, Gordon E., 4,638,335, Cl. 346-135.100.
Johnson, Michael D. A. Keepnets. 4,637,155, Cl. 43-7.000.
Johnson, Richard K.; and Algeo, John W. Apparatus for producing sterility in female animals. 4,637,818, Cl. 604-89.000.
Johnson Service Company: *See*—
DeMeyer, Roy W., 4,637,546, Cl. 236-49.000.
Johnston, David A.: *See*—
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., 4,638,452, Cl. 364-900.000.
Johnston, G. Gilbert. Volumetric flow rate determination in conduits not directly accessible. 4,637,401, Cl. 128-663.000.
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, to Institut National de la Sante et de la Recherche Medicale. Hexapeptide, process for obtaining II and the pharmaceutical compositions containing II. 4,637,997, Cl. 514-17.000.
Jones, Charles; Murphy, James L.; and Burks, Kenneth, to Jones, Charles. Hand held athletic officiating timers. 4,637,732, Cl. 368-109.000.
Jones, David I. G., to United States of America, Air Force. Fatigue test machine. 4,637,259, Cl. 73-794.000.
Jones, David M.: *See*—
Szelke, Michael; and Jones, David M., 4,638,047, Cl. 530-332.000.
Jones, J. Paul, to Med-Tech Associates. Linear impulse motor. 4,638,193, Cl. 310-15.000.
Jones, Janice L.; and Jones, Ronald E., to Case Western Reserve University. Triphasic wave defibrillation. 4,637,397, Cl. 128-419.00D.
Jones, Michael A.: *See*—
Partus, Fred P.; and Jones, Michael A., 4,638,129, Cl. 200-43.220.
Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., to Physio-Control Corporation. Connector for modular physiological instruments. 4,637,749, Cl. 403-322.000.
Jones, Ronald E.: *See*—
Jones, Janice L.; and Jones, Ronald E., 4,637,397, Cl. 128-419.00D.
Jonsson, Nils G., to Craelius AB. Device in rock drilling machines. 4,637,477, Cl. 173-149.000.
Jorgensen, Michael L. S., to Jydsk Varmekedelfabrik A/S. Stoking plant for fuel in whole bales. 4,637,327, Cl. 110-289.000.
Jorgensen, Robert W.; and Nowak, Michael R., to Harvey Hubbell Incorporated. Non-metallic liquid-tight conduit engaging connector. 4,637,639, Cl. 285-249.000.
Jourdan, Pierre: *See*—
Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, 4,637,573, Cl. 244-54.000.
Joyce International, Inc.: *See*—
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, to Robert Bosch GmbH. Digitally controlled analog operating control system, and method. 4,638,228, Cl. 318-569.000.
Jungmann, Gertrude, to Institute for Gravitational Strain Pathology, Inc. Foot supporting device. 4,637,381, Cl. 128-80.00G.
Jydsk Varmekedelfabrik A/S: *See*—
Jorgensen, Michael L. S., 4,637,327, Cl. 110-289.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Ishikawa, Takehiro, 4,638,247, Cl. 324-73.00R.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, 4,637,112, Cl. 29-159.010.
Ayata, Kenzo; Narita, Kiichi; Mori, Takasuke; and Fujimoto, Takahiko, 4,637,453, Cl. 164-468.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, 4,637,781, Cl. 417-216.000.
Tamaki, Hiroaki; and Nakamura, Joji, 4,637,758, Cl. 405-248.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Yasukawa, Kazuyoshi, 4,637,771, Cl. 414-590.000.
Kabushiki Kaisha Sensor Gijutsu Kenkyujo: *See*—
Koyama, Ario, 4,638,146, Cl. 219-147.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Nishimura, Yuji; and Koide, Teruhiko, 4,637,630, Cl. 280-807.000.
Kabushiki Kaisha Toshiba: *See*—
Aoki, Masayuki, 4,638,135, Cl. 219-10.49R.
Iida, Hitoshi; and Nakayama, Ryoichi, 4,637,494, Cl. 187-10.000.
Itoh, Yasuo, 4,638,458, Cl. 365-51.000.
Iwasaki, Hiroshi; and Ito, Shintaro, 4,637,125, Cl. 29-571.000.
Mizutani, Yoshihisa, 4,637,128, Cl. 29-576.00B.
Ogura, Masahiko, 4,638,235, Cl. 318-696.000.
Sekimura, Masayuki; and Shirouzu, Shunji, 4,637,253, Cl. 73-189.000.
Watanabe, Junji, 4,638,330, Cl. 346-76.0PH.
Watanabe, Junji, 4,638,331, Cl. 346-76.0PH.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, 4,637,594, Cl. 267-47.000.
Kabushiki Kaisha Universal: *See*—
Hamada, Norihiko, 4,637,611, Cl. 273-143.00R.
Kaji, Toshio: *See*—
Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, 4,638,350, Cl. 358-29.000.
Kajiwara, Seiji: *See*—
Iwanaka, Masaya; and Kajiwara, Seiji, 4,637,489, Cl. 181-160.000.
Kalagidis, Memorial, to Ametek, Inc. Magnetic flux shield and enhancer for brushless motors. 4,638,197, Cl. 310-67.00R.
Kallander, Clas F. R.: *See*—
Gronowitz, Jan S.; and Kallander, Clas F. R., 4,637,977, Cl. 435-15.000.
Kaluszynski, Michel: *See*—
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, 4,638,142, Cl. 219-121.0EC.
Kamada, Fujio: *See*—
Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, 4,637,508, Cl. 198-365.000.

Kamata, Yasuji: *See*—
Kuwabara, Hiroshi; Ide, Jushi; Kamata, Yasuji; and Yamashita, Kenkichi, 4,638,308, Cl. 340-736.000.

Kamionka, Harvey E.: *See*—
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.

Kamiya, Osamu; Fujiyama, Yasutomo; Ogawa, Kyosuke; and Kurokawa, Takashi, to Canon Kabushiki Kaisha. Vacuum processing apparatus. 4,637,342, Cl. 118-719.000.

Kamp, Arthur J.: *See*—
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., 4,638,168, Cl. 250-560.000.

Kampf GmbH & Co. Maschinenfabrik: *See*—
Hutzenlaub, Armin, 4,637,103, Cl. 26-73.000.

Kamyr Aktiebolag: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,637,878, Cl. 210-388.000.

Kamyr, Inc.: *See*—
Sherman, Michael I.; and Golston, Stefan, 4,637,779, Cl. 415-143.000.

Kan, Fumitaka: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.

Kanbe, Junichiro: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.

Kane Graphical Corporation: *See*—
Kane, Michael; and Hogan, Lawrence R., 4,637,153, Cl. 40-605.000.

Kane, Michael; and Hogan, Lawrence R., to Kane Graphical Corporation. Multiple configuration display sign system. 4,637,153, Cl. 40-605.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Tani, Nobutaka; and Hayashi, Tsuneo, 4,637,994, Cl. 502-404.000.

Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, to Hitachi, Ltd. Gas detecting apparatus. 4,638,443, Cl. 364-497.000.

Kanii, Norikazu: *See*—
Nakamura, Hiroshi; Toyama, Osamu; and Kanii, Norikazu, 4,637,774, Cl. 414-735.000.

Kanzaki Kokyukoki Mfg. Co. Ltd.: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,637,482, Cl. 180-132.000.

Kao Corporation: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.

Karas, Richard J.; and LaRosa, John, to American Can Company. Method for deep drawing thin metal stock into containers and thereafter coating each container. 4,637,117, Cl. 29-527.400.

Karl, Curtis L., to Henkel Corporation. Fluid friction reduction. 4,637,418, Cl. 137-13.000.

Kartchner, Earl M.; Price, Robert; and Van Horn, Gary R., to Sperry Corporation. System for the acquisition of code signals. 4,638,494, Cl. 375-2.200.

Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, to Konishiroku Photo Industry Co., Ltd. Supplementary data copying method and original picture image recorder having supplementary data display means. 4,637,707, Cl. 355-3.00R.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Adjustable strap fastener. 4,637,099, Cl. 24-200.000.

Kashima, Kazutsugu: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Spring cushioned caster having a spring biased locking member. 4,637,093, Cl. 16-35.00R.

Katashima, Seiji: *See*—
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,637,450, Cl. 164-200.000.

Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, to Hitachi, Ltd. Method and apparatus for recovering normality in moving sequence of machinery. 4,638,227, Cl. 318-565.000.

Kato, Hideo: *See*—
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-428.000.

Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot device. 4,637,775, Cl. 414-744.00R.

Kato, Takao: *See*—
Asamaki, Tatsuo; and Kato, Takao, 4,638,209, Cl. 313-359.100.

Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, to Canon Kabushiki Kaisha. Color image sensing device. 4,638,350, Cl. 358-29.000.

Kato, Tokuzo, to Canon Kabushiki Kaisha. Image sensing device. 4,638,365, Cl. 358-228.000.

Katoh, Yasuo: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Katsuta, Hiroo: *See*—
Suzuki, Kazunori; Katsuta, Hiroo; and Toriumi, Yuki, 4,637,850, Cl. 156-60.000.

Katz, Philip: *See*—
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,637,405, Cl. 128-787.000.

Kaufhold, Wolfgang: *See*—
Neupauer, Helmut; Kaufhold, Wolfgang; and Wild, Georg, 4,638,416, Cl. 363-35.000.

Kautz, David J.: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.

Kautz, Henry G.: *See*—
Zajac, William V., Jr.; Kautz, Henry G.; Kautz, David J.; Bossert, Arthur J.; and Cohen, Sidney, 4,637,928, Cl. 423-659.000.

Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing camera. 4,637,705, Cl. 354-403.000.

Kawahara, Eiichiro: *See*—
Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, 4,637,293, Cl. 91-507.000.

Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, to Naniwa Products Co., Ltd. Entirely automatic, cold box type machine for molding an integral connecting core. 4,637,450, Cl. 164-200.000.

Kawai, Sumikazu: *See*—
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,637,450, Cl. 164-200.000.

Kawajiri, Shogo: *See*—
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.

Kawakami, Takashi, to Sumitomo Heavy Industries, Ltd. Mold apparatus for continuous casting system. 4,637,452, Cl. 164-420.000.

Kawamura Cycle Co., Ltd.: *See*—
Nakamura, Shizuo, 4,637,808, Cl. 474-80.000.

Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, to Dainichiseika Color & Chemicals Mfg. Co., Ltd. Azo-pigment containing hydroxy naphthoic acid amide and an iminooxoisoindolenine components. 4,638,052, Cl. 534-575.000.

Kawamura, Masahisa: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,637,482, Cl. 180-132.000.

Kawane, Minoru, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for forcing piston ring radially outwardly. 4,637,617, Cl. 277-150.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, 4,637,540, Cl. 228-49.200.
Hagiwara, Tatsuo; Imai, Keiji; and Nagaoka, Shigenori, 4,637,562, Cl. 241-259.200.
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Kawasaki Steel Corporation: *See*—
Fukuda, Noriyoshi; and Nagasawa, Ken, 4,637,906, Cl. 264-29.100.

Kawasaki, Teruo: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Kawata, Hiroitsu: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.

Kawata, Keiji: *See*—
Komatsu, Shigeru; and Kawata, Keiji, 4,638,497, Cl. 375-116.000.

Kawata, Ken: *See*—
Hirai, Hiroyuki; and Kawata, Ken, 4,637,902, Cl. 260-545.00R.

Kawata, Shun: *See*—
Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, 4,637,707, Cl. 355-3.00R.

Kaya, Seiji: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.

Kayaba, Hitoshi: *See*—
Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, 4,638,403, Cl. 361-341.000.

Kayser, Dennis J., to Wang Laboratories, Inc. Modular power system. 4,638,178, Cl. 307-85.000.

Kazami, Kazuyuki; and Wakabayashi, Hiroshi, to Nippon Kogaku K. K. Safety apparatus for feeding a film of a camera. 4,637,702, Cl. 354-173.110.

Kazumi, Hirai, to Matsushita Electric Industrial Co., Ltd. Heating appliance having a fail-safe start switch. 4,638,137, Cl. 219-10.55B.

KCR Technology, Inc.: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

Keathley, H. Milton: *See*—
Davis, Ronald G., 4,637,965, Cl. 429-1.000.

Keatley, Andrew: *See*—
Dytch, Anthony; Keatley, Andrew; and Wright, William, 4,638,147, Cl. 219-308.000.

Keefe, Peter D. Coherent magneto-caloric effect superconductive heat engine process cycle. 4,638,194, Cl. 310-40.00R.

Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, to Energy Conversion Devices, Inc. Electrodes made with disordered active material and methods of making the same. 4,637,967, Cl. 429-101.000.

Kegelman, Thomas D.: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

Keller, Franz, to American Science and Engineering, Inc. Meter transponder hybrid. 4,638,314, Cl. 340-870.020.

Keller, Michael R.: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,637,793, Cl. 431-202.000.

Kelly, Stephen M., to Merck Patent Gesellschaft mit beschrankter Haftung. Nematic compounds. 4,637,897, Cl. 252-299.630.

Kelman, Lloyd S.: *See*—
Cleary, Patrick J.; Kelman, Lloyd S.; and Horn, Richard L., 4,638,437, Cl. 364-427.000.

Kelsey, Donald R., to Amoco Corporation. Process for preparing poly(aryl ether ketone)s. 4,638,044, Cl. 528-125.000.

Kennecott Corporation: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,637,559, Cl. 241-94.000.

Kennedy, Harold, Jr. Assembly means for standardized mechanical joint for pipeline appurtenances. 4,637,641, Cl. 285-337.000.

Kennedy, Jim. Plastic scraper. 4,637,090, Cl. 15-236.00R.

Kennedy, Weldon C., Jr., to Dowell Schlumberger Incorporated. Corrosion inhibitors for cleaning solutions. 4,637,899, Cl. 252-542.000.

Kenny, Michael: *See*—
Nimmo, Neil D.; Kenny, Michael; and Willis, David, 4,637,178, Cl. 52-36.000.

Kera, Kazuo: *See*—
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.

Kerner, Aron; and Grombchevsky, Andrei. Matrix printer and inker for indefinite length articles. 4,637,743, Cl. 400-124.000.

Kerr, Robert L., to Wean United, Inc. Roof assembly for an electric arc furnace. 4,638,492, Cl. 373-74.000.

Kervagoret, Gilbert, to Societe Anonyme D.B.A. Hydraulic assistance device for braking. 4,637,208, Cl. 60-547.100.

Kessler, Robert C.: *See*—
Ponstingl, Michael J.; Trump, Walter N.; and Kessler, Robert C., 4,637,730, Cl. 356-411.000.

Kharkovsky Nauchno-Issledovatelsky Institut Obschei i Neotlozhnoi Khirurgii: *See*—
Sorochenko, Oleg A., 4,637,392, Cl. 128-303.130.

Kibbutz Gordonia Hulda: *See*—
Goldenfeld, Iliya, 4,637,274, Cl. 74-625.000.

Kidd, Richard L.; Graf, Jerry A.; Engler, Philip J.; and Lu, Song-Chin S., to General Motors Corporation. Steering wheel pad keyboard switch assembly. 4,638,131, Cl. 200-61.550.

Kidde, Inc.: *See*—
Gillis, Joseph P.; and Jess, Norval M., 4,637,473, Cl. 169-61.000.

Kiekert GmbH & Co Kommanditgesellschaft: *See*—
Kleefeldt, Frank; and Bartel, Peter, 4,637,239, Cl. 70-264.000.

Kienzle, Karl-Ernst: *See*—
Caspar, Wolfhard; Lutze, Theodor; and Kienzle, Karl-Ernst, 4,637,395, Cl. 128-334.00R.

Kiesel, Michael: *See*—
Brennecke, Hermann; Liere, Horst; and Kiesel, Michael, 4,638,398, Cl. 361-214.000.

Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, to Anritsu Electric Company Limited. Apparatus for carrying and separating articles. 4,637,508, Cl. 198-365.000.

Kikuchi, Takehiro: *See*—
Amano, Naoki; Kayaba, Hitoshi; and Kikuchi, Takehiro, 4,638,403, Cl. 361-341.000.

Kildea, James M.; Bedner, Maria D.; and Gulick, John J., to Dow Chemical Company, The. Thermoformed plastic wrap dispenser. 4,637,514, Cl. 206-406.000.

Killark Electric Manufacturing Company: *See*—
Roots, Rolland R., 4,638,297, Cl. 340-304.000.

Killen, H. Ron; Wilkins, Scott A.; and Frantz, Douglas C., to Chrysler Motors Corporation. Non-adjustable throttle position indicator. 4,637,361, Cl. 123-339.000.

Kim, Byoung Y., to Leland Stanford Junior University, The Board of Trustees of the. Fiber optical rotation sensor with extended dynamic range. 4,637,722, Cl. 356-350.000.

Kim, Manjin J.: *See*—
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.

Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, to Futaba Denshi Kogyo Kabushiki Kaisha. Position feedback system. 4,638,421, Cl. 364-167.000.

Kimura, Kikuo, to Oki Electric Industry Co., Ltd. CMOS bias voltage generating circuit. 4,638,184, Cl. 307-297.000.

Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, to Nittan Co., Ltd. Environmental abnormality detecting apparatus. 4,638,304, Cl. 340-500.000.

King, George A.: *See*—
Iacobucci, Guillermo A.; King, George A.; Goldstein, Jacob H.; and Benemann, John R., 4,638,005, Cl. 544-336.000.

King, Gerald E.: *See*—
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., 4,637,504, Cl. 192-87.170.

King, James D., to Southwest Research Institute. Method and apparatus for measuring flow of non-homogeneous material in incompletely filled flow channels. 4,638,251, Cl. 324-306.000.

Kington, Alan D.: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,637,449, Cl. 164-132.000.

Kipphan, Helmut; and Loffler, Gerhard, to Heidelberger Druckmaschinen AG. Method for colorimetrically evaluating a sheet printed on both sides thereof. 4,637,728, Cl. 356-402.000.

Kirchanski, Stefan J.: *See*—
Brown, Michael C.; and Kirchanski, Stefan J., 4,637,986, Cl. 436-10.000.

Kirchhoff, Robert A., to Dow Chemical Company, The. Arylcyclobutenyl amido alkenoic acids and salts thereof. 4,638,078, Cl. 558-414.000.

Kirchner, Albert; Schoen, Juergen; and Happ, Ortwin, to Siemens Aktiengesellschaft. Hammer brush holder assembly for a commutator motor. 4,638,204, Cl. 310-239.000.

Kirchner, Tommy L.; and Powers, Hurshal G., to United States of America, Energy. Hand-held optical fuel pin scanner. 4,637,718, Cl. 356-71.000.

Kirkpatrick, Steven J.; Zoller, Steven A.; and Woods, Daniel L., to Procter & Gamble Company, The. Process for making a reduced density roast and ground coffee. 4,637,935, Cl. 426-443.000.

Kishimoto, Keiichi; and Yoshitake, Makoto, to Toray Silicone Co., Ltd. Organopolysiloxane viscous coupler fluids. 4,637,889, Cl. 252-75.000.

Kitazume, Shunosuke: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.

Kiuchi, Takeo: *See*—
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, 4,637,362, Cl. 123-478.000.

Klancnik, Adolph V.; and Klancnik, Kenneth A., to Universal Automatic Corporation. Machine tools. 4,637,524, Cl. 221-239.000.

Klancnik, Kenneth A.: *See*—
Klancnik, Adolph V.; and Klancnik, Kenneth A., 4,637,524, Cl. 221-239.000.

Klann, Jorg: *See*—
Althaus, Hans-Ludwig; Klann, Jorg; and Kuny, Wilhelm, 4,638,343, Cl. 357-17.000.

Kleefeldt, Frank; and Bartel, Peter, to Kiekert GmbH & Co Kommanditgesellschaft. Vehicular lock system with antilockout protection. 4,637,239, Cl. 70-264.000.

Kleffman, David R.; and Phiffer, Leroy V. Locomotive safety device. 4,637,668, Cl. 339-10.000.

Klein, Imrich, to Scientific Process & Research, Inc. Multiple-stage plasticating extruders. 4,637,790, Cl. 425-208.000.

Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., to Dow Chemical Company, The. Herbicidal sulfonamides. 4,638,075, Cl. 558-5.000.

Klimashko, Vladimir V.: *See*—
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Klofec, Miroslav: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Klop, Elmer P., to Enterprise Brass Works, Inc. Locking lid for overfill-spillage protection system. 4,637,522, Cl. 220-322.000.

Klotz, Clayton J.: *See*—
Simonsen, Glenn H.; and Klotz, Clayton J., 4,637,676, Cl. 339-113.00R.

Knight, George L. Measuring dispenser. 4,637,529, Cl. 222-452.000.

Knowles, James. Wood beam assembly. 4,637,194, Cl. 52-690.000.

Kobayashi, Ikuya: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, 4,637,487, Cl. 180-197.000.

Kobayashi, Kazuo: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Kobayashi, Kensuke; and Tazoh, Yasuo, to Iwatsu Electric Co., Ltd.; and Nippon Telegraph & Telephone Public Corporation. Analog signal measuring apparatus. 4,638,185, Cl. 307-352.000.

Kobler, Robert J., to AMP Incorporated. Annular connector seal. 4,637,674, Cl. 339-94.00M.

Koch, Harold O.: *See*—
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.

Koelling, Robert K., Sr., to Morgan Construction Company. Split yoke universal joint. 4,637,807, Cl. 464-135.000.

Koga, Takeri: *See*—
Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, 4,637,567, Cl. 242-56.00R.

Kohn, Joachim; and Langer, Robert S., to Massachusetts Institute of Technology. Non-peptide polyamino acid bioerodible polymers. 4,638,045, Cl. 530-323.000.

Kohno, Teruhisa, to Sumitomo Electric Industries, Ltd. Deceleration-balanced type brake pressure control valve assembly. 4,637,661, Cl. 303-24.00A.

Kohri, Naomichi, to Victor Company of Japan, Ltd. Tape recorder having an improved system for controlling tape travel and magnetic head movement. 4,638,385, Cl. 360-96.400.

Koide, Hideo: *See*—
Iwanaka, Masaya; and Kajiwara, Seiji, 4,637,489, Cl. 181-160.000.

Koide, Teruhiko: *See*—
Nishimura, Yuji; and Koide, Teruhiko, 4,637,630, Cl. 280-807.000.

Koike, Nobuhiko, to NEC Corporation. Router unit and routing network for determining an output port by detecting a part of an input packet. 4,638,475, Cl. 370-60.000.

Koizumi, Norihiko: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, 4,637,315, Cl. 104-135.000.

Kokusan Kinzoku Kogyo: *See—*
Mochida, Haruo; and Namazue, Hirotoshi, 4,638,292, Cl. 340-63.000.

Kolbas, Robert M.: *See—*
Carney, James K.; and Kolbas, Robert M., 4,637,122, Cl. 29-569.00L.

Komai, Kensaku: *See—*
Matsuda, Kumehiko; and Komai, Kensaku, 4,638,435, Cl. 364-405.000.

Komatsu, Masao; and Fujita, Hiroshi, to Osaka University. Process for accelerating of amorphization of intermetallic compounds by a chemical reaction using lattice defects. 4,637,927, Cl. 423-644.000.

Komatsu, Shigeru; and Kawata, Keiji, to Hitachi, Ltd.; and Hitachi Video Engineering, Ltd. Framing code detector for a teletext receiver. 4,638,497, Cl. 375-116.000.

Komoda, Norihisa: *See—*
Katayama, Masanori; Komoda, Norihisa; Murata, Tomohiro; and Kera, Kazuo, 4,638,227, Cl. 318-565.000.

Konai, Yutaka: *See—*
Iizuka, Akira; Konai, Yutaka; Yamauchi, Takashi; and Hayashi, Shoichiro, 4,638,087, Cl. 562-467.000.

Kondo, Yoshihito: *See—*
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, 4,637,200, Cl. 53-551.000.

Konishi, Jin-emon, to Nippon Zoki Pharmaceutical Co., Ltd. Antiulcer composition containing a dipeptide compound. 4,637,996, Cl. 514-11.000.

Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, to Japan Atomic Energy Research Institute. Recovery method of tritium from tritiated water. 4,637,866, Cl. 204-129.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, 4,637,707, Cl. 355-3.00R.
Miyamae, Hiroshi; and Banno, Makoto, 4,637,690, Cl. 350-427.000.
Shigeta, Kunio; Yamamoto, Yoko; and Takahashi, Jiro, 4,637,973, Cl. 430-122.000.
Takei, Yoshiaki; Nomori, Hiroyuki; and Matuura, Katumi, 4,637,971, Cl. 430-59.000.

Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, to Yamanouchi Pharmaceutical Co, Ltd. Transdermal formulation of nicardipine hydrochloride. 4,637,930, Cl. 424-28.000.

Korn, Marcel. Office fabricated, adjustable function regulator. 4,637,796, Cl. 433-7.000.

Kornbluh, Roy D.: *See—*
Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., 4,637,736, Cl. 374-45.000.

Koshinaka, Eiichi: *See—*
Itho, Yasuo; Kato, Hideo; Ogawa, Nobuo; Yamagishi, Kagari; Koshinaka, Eiichi; and Nishino, Hiroyuki, 4,638,009, Cl. 514-428.000.

Kosonocky, Walter F.: *See—*
Elabd, Hammam; and Kosonocky, Walter F., 4,638,345, Cl. 357-24.000.

Koster, William H.: *See—*
Slusarchyk, William A.; and Koster, William H., 4,638,061, Cl. 540-355.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, 4,638,060, Cl. 540-203.000.

Kostylev, Alexandr D.: *See—*
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Kotting, Fritz; and Barwasser, Gunther, to Wernicke & Co. GmbH. Spectacle lens edge grinding machine. 4,637,168, Cl. 51-50.0PC.

Koulbanis, Constantin: *See—*
Zabotto nee Arribau, Arlette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, 4,637,933, Cl. 424-131.000.

Kovacs, Gabor: *See—*
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Kovar, Pavel: *See—*
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Kowa Co., Ltd.: *See—*
Aoki, Nobuo; and Kurosawa, Shinichiro, 4,638,050, Cl. 530-413.000.

Koyama, Ario, to Nagase Sangyo Kabushiki Kaisha; and Kabushiki Kaisha Sensor Gijutsu Kenkyujo. Method of protecting eyes from welding rays in arc welding and apparatus therefor. 4,638,146, Cl. 219-147.000.

Koyo Jidoki Kabushiki Kaisha: *See—*
Ijiri, Waichiro; and Hirakushi, Shuzo, 4,637,484, Cl. 180-142.000.

Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Recording apparatus. 4,638,390, Cl. 360-74.100.

Krabetz, Richard: *See—*
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.

Kramer, Alfred V.: *See—*
Burns, Hugh D.; Zemyan, Susan E.; Epps, Leon A.; Kramer, Alfred V.; and Dannals, Robert F., 4,638,051, Cl. 534-14.000.

Kramer, Arthur W.: *See—*
Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.

Kranzler, Ernst, to Robert Bosch GmbH. Hand-held tool with an electric motor and wearing shells for supporting the same. 4,638,196, Cl. 310-50.000.

Kraus, Edmund J.: *See—*
Kraus, Robert A.; and Kraus, Edmund J., 4,637,261, Cl. 73-861.020.

Kraus, Robert A.; and Kraus, Edmund J. Mass-flow sensing transducer for internal combustion engines. 4,637,261, Cl. 73-861.020.

Krehl, Hermann: *See—*
Schmid, Rene; and Krehl, Hermann, 4,637,565, Cl. 242-55.100.

Krettek, Ottmar: *See—*
Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, 4,637,646, Cl. 295-37.000.

Kreutzer, Hans: *See—*
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Krinsky, Barnet: *See—*
Eggert, Dennis J.; Hendrix, Charles E.; and Krinsky, Barnet, 4,638,320, Cl. 342-442.000.

Krob, Vaclav: *See—*
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Kronenthal, David, to E. R. Squibb & Sons, Inc. 3-acylamino-2-oxo-1-azetidinesulfonic acids. 4,638,062, Cl. 540-355.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See—*
Weiss, Wilhelm, 4,637,438, Cl. 141-6.000.

Krueger, Helmut. Method and an apparatus for determining refraction of the human eye. 4,637,700, Cl. 351-211.000.

Krug, William: *See—*
Minten, Karl; and Krug, William, 4,637,987, Cl. 436-151.000.

Krull, Ulrich J.; and Thompson, Michael, to Allied Corporation. Stabilized, lipid membrane-based device and method of analysis. 4,637,861, Cl. 204-1.00T.

Kubiak, John W.: *See—*
Seeger, John W., Jr.; and Kubiak, John W., 4,637,551, Cl. 239-288.500.

Kubit, Raymond G., to Weber Marking Systems, Inc. Xerographic copying on a transparent sheet. 4,637,974, Cl. 430-126.000.

Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd. Heat-developable photographic materials. 4,637,975, Cl. 430-353.000.

Kubota, Kazufumi, to Fuji Photo Film Co., Ltd. Method of reading bar code. 4,638,170, Cl. 250-566.000.

Kubota, Ltd.: *See—*
Hasegawa, Shigekazu; and Fukui, Tetsu, 4,637,269, Cl. 74-335.000.
Tatsumi, Hiroshi, 4,638,157, Cl. 250-236.000.

Kubota, Yuichi: *See—*
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.

Kucherer, Helmut, to Weidenhammer Packungen KG GmbH & Co. Fiber can with reinforcing crimped metal closure. 4,637,543, Cl. 229-5.600.

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Kurata, Masami: *See—*
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Stoltz, Richard A.; and Kwon, Young J., 4,637,831, Cl. 75-84.500.

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Bernard, Daniel, 4,637,106, Cl. 29-25.420.

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Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.
Brisson, Alain; and Clement, Jean R., 4,638,279, Cl. 335-257.000.
Fauvet, Jean-Pierre; and Parisel, Jacques, 4,638,419, Cl. 363-87.000.

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de Vos, Hendrik A. J.; and Labouliere, Elzear R., 4,638,414, Cl. 362-370.000.

Labthermics Technologies, Inc.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

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DeAngelis, Thomas P.; and Lachman, Irwin M., 4,637,995, Cl. 502-439.000.

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Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., to Continental Pharma. Heterocyclic amino-alcohol derivatives. 4,638,070, Cl. 549-23.000.

Lamberty, Bernard J., to Boeing Company, The. Multiple feed antenna. 4,638,322, Cl. 343-761.000.

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Urban, Ted F., 4,637,414, Cl. 135-73.000.

Lamie, Billy J.: *See*—
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., 4,637,260, Cl. 73-826.000.

Lamusga, Gary R., to Toro Company, The. Lawn mower grass collector bag support. 4,637,202, Cl. 56-16.600.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Reversible phase change composition for storing energy. 4,637,888, Cl. 252-70.000.

Lange, Fredric A., to Interlock Structures International, Inc. Connecting apparatus. 4,637,193, Cl. 52-648.000.

Langer, Robert S.: *See*—
Kohn, Joachim; and Langer, Robert S., 4,638,045, Cl. 530-323.000.

Laragione, Robert; Lurcott, Steven M.; Bowe, Woodford A.; and Levy, Eugene J., to Chemical Data Systems, Inc. Microprocessor-controlled back-pressure system for small volume chemical analysis applications. 4,638,444, Cl. 364-510.000.

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Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.

Larkin, William J. Integrated solar heating unit. 4,637,375, Cl. 126-434.000.

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LaRosa, John: *See*—
Karas, Richard J.; and LaRosa, John, 4,637,117, Cl. 29-527.400.

Larson, Wayne K.; and Hedrick, Steven T., to Minnesota Mining and Manufacturing Company. Hydrophilic polyurethane/polyurea sponge. 4,638,017, Cl. 521-157.000.

Latta, William A., Jr., to Automated Industrial Systems. Indexing laser marker. 4,638,144, Cl. 219-121.0LH.

Laubach, Donald R. Bull elk calling device. 4,637,154, Cl. 43-1.000.

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Laure, Christian: *See*—
Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, 4,638,167, Cl. 250-551.000.

Lauri, Vaino G.: *See*—
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.

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White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H., 4,637,211, Cl. 60-650.000.

Laux, Steven E.: *See*—
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Leach, John G.: *See*—
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.

Leahy, Ronald S.: *See*—
Bishop, F. Avery; and Leahy, Ronald S., 4,638,493, Cl. 375-1.000.

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Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., 4,638,187, Cl. 307-451.000.

Le Corre, Loic; and Rolland, Albert L., to Precision Mecanique Labinal. High speed permanent magnet rotor. 4,638,200, Cl. 310-156.000.

Lectron Products, Inc.: *See*—
Miller, Ellsworth S., 4,638,132, Cl. 200-81.00R.

Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Methods of using selective optical excitation in deposition processes and the detection of new compositions. 4,637,938, Cl. 427-53.100.

Lee, Patrick S., to Ampex Corporation. Bang-bang controlled velocity command generator. 4,638,230, Cl. 318-632.000.

Lee, Soong H.: *See*—
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Le Floch, Gerard, to U.S. Philips Corporation. Method of and circuit for digitally demodulating an amplitude-modulated signal produced by suppressed-carrier amplitude modulation of two carriers of the same frequencies in a phase-quadrature relationship. 4,638,349, Cl. 358-23.000.

Leiboff, Arnold. Method and apparatus for intestinal irrigation. 4,637,814, Cl. 604-27.000.

Leising, Lawrence J., to Schlumberger Technology Corporation. Methods and apparatus for controlled directional drilling of boreholes. 4,637,479, Cl. 175-26.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Kim, Byoung Y., 4,637,722, Cl. 356-350.000.

Lemole, Gerald M. Irrigational hemostatic solution. 4,637,815, Cl. 604-28.000.

Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, to Fuji Xerox Co., Ltd. Color copier. 4,638,372, Cl. 358-296.000.

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Marini, Ingo G.; and Sustmann, Scarlet, 4,637,820, Cl. 8-129.000.

Leonard, Willie B. Tractor and towed implement with elevation control system for implement including pressure responsive valve actuator. 4,637,474, Cl. 172-7.000.

Leonov, Ivan P.: *See*—
Gurkov, Konstantin S.; Kostylev, Alexandr D.; Tkachenko, Gennady A.; Leonov, Ivan P.; and Klimashko, Vladimir V., 4,637,476, Cl. 173-136.000.

Leppek, William W., to Mead Corporation, The. Antitheft bicycle handlebar bag. 4,637,534, Cl. 224-36.000.

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Cazcarra, Victor; and LeRoueille, Jocelyne, 4,637,123, Cl. 29-569.00R.

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Delwel, Francois; and Claassens, Marinus L. M., 4,637,891, Cl. 252-135.000.
Levine, Jules D.: *See*—
Witter, David E.; and Levine, Jules D., 4,637,855, Cl. 156-616.00R.
Levine, Morris M., to Sweet Victory, Inc. Mixing apparatus and method. 4,637,221, Cl. 62-342.000.
Levine, Richard A. Double-blind labels. 4,637,635, Cl. 283-101.000.
Levinson, Lionel M., to General Electric Corp. Tubular varistor arrangement. 4,638,284, Cl. 338-21.000.
Levis, William W., Jr.: *See*—
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Leviton Manufacturing Company, Inc.: *See*—
Johnson, George E.; and Newman, Walter, 4,637,671, Cl. 339-50.00R.
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Lewis, Dean M.: *See*—
Benson, Terrance G.; and Lewis, Dean M., 4,637,204, Cl. 56-249.000.
Lewis, Richard J., to Allied Corporation. Structural core pivot. 4,637,596, Cl. 267-160.000.
Lewis, Robert M.; and Van Santen, Rutger A., to Shell Oil Company. Intercalated clay compositions. 4,637,992, Cl. 502-84.000.
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Racz, Gabor B.; and Lewis, Royce C., 4,637,394, Cl. 128-327.000.
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Stone, Richard H., 4,637,627, Cl. 280-686.000.
Li, George S.; Wu, Muyen M.; and De Witt, Elmer J., to Standard Oil Company, The. Copolymers containing indene. 4,638,042, Cl. 526-280.000.
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Barth, Rudiger, 4,638,389, Cl. 360-72.100.
Holpp, Wolfgang, 4,638,267, Cl. 333-1.100.
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Lightstone, Alexander W., to RCA, Inc. Method for making an avalanche photodiode. 4,637,126, Cl. 29-572.000.
Ligon, Robert C.: *See*—
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Lim, Basilio Y.; and Marsh, Richard N. Multi-section capacitor electrically coupled in parallel. 4,638,402, Cl. 361-328.000.
Lin, Ta C. Bi-section adjustable connector bridging an opened handrail. 4,637,589, Cl. 256-59.000.
Lin, Ted T. Multiple-pole stepping motor. 4,638,195, Cl. 310-49.00R.
Lindahl, Anthony T.: *See*—
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Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., to AT&T Technologies, Inc.; and Bell Telephone Laboratories. Method of preparing a ceramic composition. 4,637,989, Cl. 501-135.000.
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Little, Douglas J., to Dow Chemical Company, The. Recrystallization of bisphenol A by azeotropically drying the solvent. 4,638,102, Cl. 568-724.000.
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Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, to Affarsverket FFV. Arrangement for a submarine vehicle. 4,637,213, Cl. 60-685.000.
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Lofquist, Alden A., Jr. Metering pump with diaphragm. 4,637,784, Cl. 417-320.000.
Logan, David J., to Metromedia, Inc. Method and apparatus for improving gray scale resolution in an ink jet printing system. 4,638,373, Cl. 358-298.000.
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Lombardo, Frank; Jernigan, Edward L.; and Furze, Paul, to Dixon Industries Corporation. Apparatus and process for etching fluoroplastics. 4,637,856, Cl. 156-637.000.
Long, Delmar D., to Dayco Corporation. Elastomer-coated bias reinforcement fabric and method for producing same. 4,637,940, Cl. 427-176.000.
Long, Dennis L. Modular unit adapted for office use. 4,637,177, Cl. 52-36.000.
Loop, Floyd D. Pillow or support member for surgical use. 4,637,377, Cl. 128-1.00R.
Loose, Winfield W., to AMP Incorporated. Insulation displacing barrel terminal. 4,637,675, Cl. 339-97.00R.
Lopez, Edward L., to Lockheed Corporation. Toxic environmental breathing hood. 4,637,383, Cl. 128-201.250.
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Lorentz, Donald G.: *See*—
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Los, Marinus, to American Cyanamid Company. 2-(2-imidazolin-2-yl)-pyridines and quinolines, process and intermediates for the preparation thereof, and use of said compounds as herbicidal agents. 4,638,068, Cl. 546-169.000.
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Thompson, Richard E.; and Urzel, Robert G., 4,637,498, Cl. 188-71.900.
Lucca, Eusebio, to Matec Holding. Process for producing double-layered structures. 4,637,909, Cl. 264-510.000.
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Luke, John A., to Brown & Williamson Tobacco Corporation. Cigarettes. 4,637,410, Cl. 131-361.000.
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Lyon, Ronald J: Fill control valve. 4,637,426, Cl. 137-433.000.
MacGovern, Alan J.: *See—*
Howell, Richard H.; and MacGovern, Alan J., 4,637,724, Cl. 356-353.000.
Machamer, George A. Resonator comprising a coil formed of multiple layer alternately arranged conductive turns. 4,638,270, Cl. 333-175.000.
MacPhee, Colin A. A.; and Yoon, Ohjhong, to Federal Pioneer Limited. Detection of ground faults in ungrounded DC power supply systems. 4,638,245, Cl. 324-51.000.
Maeda, Chiaki: *See—*
Hisamoto, Iwao; Maeda, Chiaki; and Nishiwaki, Mitsuhiro, 4,638,089, Cl. 564-292.000.
Maehara, Yasuhiro, to Sumitomo Metal Industries, Ltd. Superplastic deformation of duplex stainless steel. 4,637,841, Cl. 148-12.00E.
Maekawa, Taijiro; and Fujino, Yukio, to Anmin Manufacturing Co., Ltd. Heat insulation material. 4,637,947, Cl. 428-68.000.
Maekawa, Yukio: *See—*
Ishimura, Toshihiko; and Maekawa, Yukio, 4,637,704, Cl. 354-286.000.
Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, to Siemens Aktiengesellschaft. Branch connector for light waveguides. 4,637,682, Cl. 350-96.150.
Maiden-Nesset, Mary L. Child's doll useful for teaching counting, color identification, and for promoting manual dexterity. 4,637,798, Cl. 434-191.000.
Main, W. Eric: *See—*
Lunn, Gerald K.; Main, W. Eric; and McGinn, Michael, 4,638,265, Cl. 333-214.000.
Maincent, Gabriel: *See—*
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, 4,638,370, Cl. 358-293.000.
Mainemer, Carlos I.: *See—*
Wang, An; Ho, Shu-Kuang; and Mainemer, Carlos I., 4,638,118, Cl. 178-18.000.
Mainstay, Inc.: *See—*
Peterson, Laetta M., 4,637,344, Cl. 119-52.00R.
Maki, Yohji; and Umezawa, Norio, to Matsushita Electric Industrial Co., Ltd. Attachment structure for brush holder springs. 4,638,203, Cl. 310-239.000.
Makibayashi, Katsunori: *See—*
Mishima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, 4,637,595, Cl. 267-52.000.
Makida, Kazuhisa: *See—*
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.
Makimoto, Mitsuo: *See—*
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,638,180, Cl. 307-219.100.
Makino, Teruyoshi: *See—*
Ono, Minoru; and Makino, Teruyoshi, 4,637,703, Cl. 354-276.000.
Malkki, Yrjo : *See—*
Pellinen, Markku; Malkki, Yrjo ; and Niskanen, Aimo, 4,637,163, Cl. 47-1.100.
Mallinckrodt, Inc.: *See—*
Inskip, Ervin B.; and Patane, Joseph M., 4,638,079, Cl. 560-4.000.
Mance, Andrew M.: *See—*
Eesley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., 4,637,862, Cl. 204-15.000.
Manchem Limited: *See—*
Holland, Frank S., 4,638,074, Cl. 556-98.000.
Mann, Derek, to Dobson Park Industries, PLC. Apparatus for the oral administration of capsules to animals. 4,637,816, Cl. 604-62.000.
Manning, James H.; and Sorenson, Wayne P., to James River Corporation. Scrim reinforced, flat cloth-like composite laminate and a method of making. 4,637,949, Cl. 428-110.000.
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Hennebert, Pierre; Gillard, Jean; and Roland, Michel, 4,637,916, Cl. 422-36.000.
Manufacture de Rougement: *See—*
de Roure, Olivier P. R., 4,637,516, Cl. 206-471.000.
Manville Sales Corporation: *See—*
Gill, Frederick A.; and Tocci, Mario P., 4,637,951, Cl. 428-215.000.
Wilson, Jerry F.; and Schuster, Richard L., 4,637,515, Cl. 206-434.000.
Mar-Chaim, Yechiam: *See—*
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.
Maraven, S.A.: *See—*
Hernandez, Gabriel D., 4,637,458, Cl. 166-68.000.
Marchand, Gilles: *See—*
Jeffrey, Paul W.; and Marchand, Gilles, 4,637,842, Cl. 148-12.70A.
Marcus, Edward N. For characterizing a heart condition. 4,637,400, Cl. 128-653.000.
Marcus, Mitchell S.: *See—*
Arnold, Marc E.; and Marcus, Mitchell S., 4,637,712, Cl. 355-75.000.
Marguth, Val M.: *See—*
Gray, Robert R.; and Marguth, Val M., 4,637,794, Cl. 432-58.000.
Maria van Riet, Wilhelmus A., to Dow Chemical Company, The. Thermal insulation system. 4,637,189, Cl. 52-309.800.
Marini, Ingo G.; and Sustmann, Scarlet, to Lenzing Aktiengesellschaft. Copper-modified carboxyalkyl-cellulose fiber. 4,637,820, Cl. 8-129.000.
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., to Dow Chemical Company, The. Apparatus for measurement of hollow fiber dimensions. 4,638,168, Cl. 250-560.000.
Mark, Harold W.: *See—*
Lindstrom, Merlin R.; and Mark, Harold W., 4,637,833, Cl. 106-14.130.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Polycarbonate exhibiting improved heat resistance from cycloalkylidene diphenol. 4,638,027, Cl. 524-157.000.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Polycarbonate exhibiting improved heat resistance from halogenated cycloalkylidene diphenol. 4,638,036, Cl. 525-462.000.
Markert, Helmut: *See—*
Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hans; and Schmiedel, Manfred, 4,638,019, Cl. 522-104.000.
Markham, Roger G.: *See—*
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Torpey, Peter A.; and Markham, Roger G., 4,638,337, Cl. 346-140.00R.
Markstein, George H.: *See—*
de Ris, John; and Markstein, George H., 4,637,735, Cl. 374-8.000.
Marlen Research Corporation: *See—*
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., 4,637,936, Cl. 426-523.000.
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, to Plug-In Storage Systems, Inc. Wrist strap ground monitor. 4,638,399, Cl. 361-220.000.
Marsh, David J.: *See—*
Crane, Michael P.; and Marsh, David J., 4,638,481, Cl. 371-27.000.
Marsh, Richard N.: *See—*
Lim, Basilio Y.; and Marsh, Richard N., 4,638,402, Cl. 361-328.000.
Marshall, Ralph C.; and Consoli, Ronald P. Air conditioning apparatus. 4,637,225, Cl. 62-285.000.
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Nevalainen, Kyosti; and Martikainen, Kaarlo, 4,637,240, Cl. 70-366.000.
Martin, Daniel B., to International Business Machines Corporation. Performance evaluation for an asymmetric multiprocessor system. 4,638,427, Cl. 364-200.000.
Martin, Graham J., to Litton Systems, Inc. Non-planar ring laser accelerometer. 4,637,255, Cl. 73-517.00R.
Martin, Henry A.: *See—*
Badaracco, John A.; and Martin, Henry A., 4,637,088, Cl. 15-97.00R.
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., to Sperry Corporation. Power density spectrum controller. 4,638,417, Cl. 363-41.000.
Martin, James A.: *See—*
Hartmann, Wilhelm U.; and Martin, James A., 4,637,877, Cl. 210-347.000.
Martinelli, Robert M., to Mullett Associates, Inc. Uninterruptible power supply. 4,638,176, Cl. 307-64.000.
Martinez, Armando. Device for storing dental floss and for forming three separately-usable strips of floss for use with tensioning means. 4,637,412, Cl. 132-92.00R.
Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, to Nippon Telegraph & Telephone Public Corporation. Optical adhesive composition. 4,637,939, Cl. 427-162.000.
Maruska, Gerald F. Method and apparatus for peeling sausage. 4,637,095, Cl. 17-49.000.
Massachusetts Institute of Technology: *See—*
Bernard, John A., Jr., 4,637,911, Cl. 376-217.000.
Kohn, Joachim; and Langer, Robert S., 4,638,045, Cl. 530-323.000.
Schweickert, Robert K., 4,638,248, Cl. 324-76.00R.
Masterson, Daniel M.: *See—*
Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.

Masuda, Eiji; and Sakamoto, Shigemi, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital-analog converter. 4,638,303, Cl. 340-347.0DA.

Masuda, Shunichi: *See*—
Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.

Masuda, Toyohiko: *See*—
Horibe, Youshun; Ohshima, Yoshikuni; and Masuda, Toyohiko, 4,637,350, Cl. 122-441.000.

Masuho, Yasuhiko; Hara, Takeshi; and Noguchi, Teruhisa, to Teijin Limited. Antitumor protein hybrid and process for the preparation thereof. 4,638,049, Cl. 530-388.000.

Masui, Takeshi; and Sano, Morio, to Denki Kagaku Kogyo Kabushiki Kaisha. Anti-static jacket for floppy disk. 4,637,945, Cl. 428-35.000.

Matec Holding: *See*—
Lucca, Eusebio, 4,637,909, Cl. 264-510.000.

Matheny, Rodney C.: *See*—
Turcott, James L.; and Matheny, Rodney C., 4,637,539, Cl. 227-156.000.

Mathews, Jimmie C., Sr. Riveting apparatus. 4,637,114, Cl. 29-243.540.

Mathonnet, Jean-Marc: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

Matoba, Yoshiaki; and Ozawa, Hitoshi, to Daikin Industries, Ltd. Scroll type fluid apparatus with lubrication of rotation preventing mechanism and thrust bearing. 4,637,786, Cl. 418-55.000.

Matovich, Edwin; and Spannuth, Robert J., to Crown Zellerbach Corporation. Pyrolysis of black liquor at high temperatures using radiant energy. 4,637,858, Cl. 162-30.100.

Matsubayashi, Kaneo, to Toyo Suisan Kikai Co. Ltd.; and Taiyo Fishery Co. Ltd. Apparatus for collecting flesh of fish. 4,637,094, Cl. 17-1.00G.

Matsuda, Kumehiko; and Komai, Kensaku, to Sharp Kabushiki Kaisha. Electric cash register having direct price look-up function. 4,638,435, Cl. 364-405.000.

Matsuda, Toshiro, to Nissan Motor Company, Limited. Anti-skid brake control system performing skid control with both open and close feedback techniques. 4,637,663, Cl. 303-106.000.

Matsuda, Toyoshi: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Matsuda, Yasumasa: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,638,326, Cl. 346-75.000.

Matsuhisa, Yohji: *See*—
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,637,925, Cl. 423-447.400.

Matsumoto, Kazuya: *See*—
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, 4,637,684, Cl. 350-96.190.

Matsumoto, Satoshi: *See*—
Asari, Akira; Matsumoto, Satoshi; Hattori, Shigeo; and Dosai, Takayoshi, 4,637,112, Cl. 29-159.010.

Matsumoto, Tetsuro, to Hitachi, Ltd. Semiconductor memory device. 4,638,460, Cl. 365-149.000.

Matsumoto, Tsutomu: *See*—
Eto, Kunihiko; Iwashita, Shigeo; and Matsumoto, Tsutomu, 4,637,483, Cl. 180-142.000.

Matsumura, Yasushi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,637,145, Cl. 34-1.000.

Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Matsuno, Tatsuji, to Toyo Communication Equipment Co., Ltd. Method and device for measuring insulation deterioration of electric line. 4,638,242, Cl. 324-51.000.

Matsuo, Kuniyuki: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Matsushima, Seiya: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hayashi, Seizo; Okano, Kenji; and Hayashi, Nobuhiro, 4,637,092, Cl. 15-319.000.
Kazumi, Hirai, 4,638,137, Cl. 219-10.55B.
Maki, Yohji; and Umezawa, Norio, 4,638,203, Cl. 310-239.000.
Nozoe, Toshiro; and Yamashita, Akira, 4,638,358, Cl. 358-147.000.
Oshima, Mitsuaki; and Yamaguchi, Kazufumi, 4,638,362, Cl. 358-213.000.
Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,638,180, Cl. 307-219.100.
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, 4,637,256, Cl. 73-633.000.

Matsushita Electric Works, Ltd.: *See*—
Kuwabara, Hideo; and Ohta, Takao, 4,638,128, Cl. 200-33.00R.

Matsushita Electronics Corporation: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,637,130, Cl. 29-588.000.

Mattaboni, Paul J. Autonomous mobile robot. 4,638,445, Cl. 364-513.000.

Mattel, Inc.: *See*—
Hegel, James D.; and Johnson, Davin W., 4,637,907, Cl. 264-45.700.

Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, to Robert Bosch GmbH. Extended response trigger circuit. 4,638,179, Cl. 307-10.0SB.

Matuura, Katumi: *See*—
Takei, Yoshiaki; Nomori, Hiroyuki; and Matuura, Katumi, 4,637,971, Cl. 430-59.000.

Maurer, Robert; and Epstein, Peter C. Meter provers. 4,637,244, Cl. 73-3.000.

Max Baermann, G.m.b.H.: *See*—
Baermann, Horst, 4,638,281, Cl. 335-303.000.

Mayr, Fritz; and Dasser, Manfred, to Christian Mayr GmbH & Co. KG. Overload release mechanism for torque couplings. 4,637,502, Cl. 192-56.00R.

Mazda Motor Corporation: *See*—
Okino, Kiyomi; and Muramoto, Takumi, 4,637,648, Cl. 296-63.000.

Mazzorana, Alfred B., to Societe de Paris et du Rhone. Engagement control of the starter pinion for internal combustion engine starter. 4,637,267, Cl. 74-7.00A.

McAdams, Hugh P., to Texas Instruments Incorporated. High-level CMOS driver circuit. 4,638,182, Cl. 307-270.000.

McArthur, James. Drive unit for exercising apparatus. 4,637,607, Cl. 272-132.000.

McCallum, R. William: *See*—
Keem, John E.; Bergeron, Richard C.; Custer, Russell C.; and McCallum, R. William, 4,637,967, Cl. 429-101.000.

McCandless, Harry E., to RCA Corporation. Method of constructing an electron gun having an improved transition member and product thereof. 4,637,804, Cl. 445-36.000.

McCarthy, John F.: *See*—
Badger, Christopher W.; Burdette, Everette C.; Leech, Steven C.; and McCarthy, John F., 4,638,436, Cl. 364-414.000.

McCarver, Byron M.: *See*—
Sansing, James E.; and McCarver, Byron M., 4,637,921, Cl. 423-315.000.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Preparation of ethylene-acrylic acid copolymer or salt thereof. 4,638,034, Cl. 525-369.000.

McClung, Charles S.: *See*—
Rainer, Norman B.; and McClung, Charles S., 4,637,408, Cl. 131-331.000.

McCoy, James N. Echo ranging gun. 4,637,463, Cl. 166-250.000.

McDonald, Donald G., to United States of America, Commerce. Amplification by a phase locked array of Josephson junctions. 4,638,257, Cl. 330-61.00R.

McFarlin, Terry. Integral lightweight tent and box for portable applications. 4,637,416, Cl. 135-109.000.

McGinlay, James G.; and Urguhart, Roderick M. Micro hard-disk drive system. 4,638,383, Cl. 360-77.000.

McGinley, John: *See*—
McMahon, J. Philip; Spoel, Han; and McGinley, John, 4,637,591, Cl. 266-165.000.

McGinn, Michael: *See*—
Lunn, Gerald K.; Main, W. Eric; and McGinn, Michael, 4,638,265, Cl. 333-214.000.

McGinniss, Vincent D., to Three Bond Co., Ltd. Catalyst systems for two-pack acrylic adhesive formulations. 4,638,035, Cl. 525-384.000.

McGlothen, Jody R.; and Little, Damon P., to Dresser Industries, Inc. Parallel flow tube apparatus. 4,637,460, Cl. 166-189.000.

McGlothen, Jody R.: *See*—
Spriggs, Dennis M.; and McGlothen, Jody R., 4,637,469, Cl. 166-310.000.

McGowan, Michael J.: *See*—
Adams, Philip E.; McGowan, Michael J.; and Yunan, Malak E., 4,637,312, Cl. 102-275.120.

McGuigan, Brian G. Humidity reduction duct. 4,637,224, Cl. 62-271.000.

McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., to Sperry Corporation. Low noise amplifier with high intercept point. 4,638,261, Cl. 330-277.000.

McKee, Jere L.: *See*—
Thomas, Glenn R.; and McKee, Jere L., 4,638,277, Cl. 335-190.000.

McKibben, David M.: *See*—
Rhee, Chong-Kon; McKibben, David M.; and Bibbee, Jeffrey N., 4,637,252, Cl. 73-150.00A.

McLaughlin, Kevin L., to Motorola, Inc. BIMOS logic gate. 4,638,186, Cl. 307-446.000.

McMahon, J. Philip; Spoel, Han; and McGinley, John. Dross cooler and processor. 4,637,591, Cl. 266-165.000.

McManis, George E.: *See*—
Covino, Josephine; and McManis, George E., 4,637,864, Cl. 204-61.800.

McMillan, Stephen L.; Akers, Alvin; and Toma, Daniel N., to General Electric Company. Clothes washing machine including a high detergent concentration wash cycle. 4,637,231, Cl. 68-4.000.

McPherson, Alexander W.; and Hamed, Hazem N., to De-Sta-Co Division/Dover Corporation. Locking power clamp. 4,637,597, Cl. 269-32.000.

McQueen, Coy E.; Twedt, Lynn O.; and Thurnau, Edwin H., to Erect-A-Tube, Inc. Building and bi-fold door assembly. 4,637,446, Cl. 160-207.000.

Mead Corporation, The: *See*—
Leppek, William W., 4,637,534, Cl. 224-36.000.

Meadows, Roger D.: *See*—
Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., 4,637,638, Cl. 285-158.000.

Med-Tech Associates: *See*—
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Med-Vest Inc.: *See*—
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., 4,637,075, Cl. 2-94.000.

Medeot, Renzo, to FIP Industriale S.p.A. Water jet scarifying apparatus. 4,637,656, Cl. 299-1.000.

Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., to Swagelok Company. Coupling. 4,637,432, Cl. 137-614.030.

Medvick, Richard J.: *See*—
Scheffel, Gary W.; Medvick, Richard J.; and Steiss, William C., 4,637,430, Cl. 137-516.290.

Meguro, Satoshi: *See*—
Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, 4,637,124, Cl. 29-571.000.

Melendy, Clifford P., to Portex, Inc. Tracheal tube obturator with reversible tip. 4,637,388, Cl. 128-207.140.

Melle, Carl A.: *See*—
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., 4,637,956, Cl. 428-391.000.

Melman, Haim, to Elscint Ltd. System and methods for improving video camera performance. 4,638,355, Cl. 358-111.000.

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Crane, Michael P.; and Marsh, David J., 4,638,481, Cl. 371-27.000.

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Handwerk, Roy R., 4,637,574, Cl. 244-104.0FP.

Menigat, Roland; and Gruppenbacher, Klaus, to Hofmann Werkstatt-Technik GmbH. Method of continuous compensation of unbalance present in a rotor and in particular in a grinding wheel. 4,637,171, Cl. 51-281.00R.

Mente, Kurt, to J. H. Benecke GmbH. Apparatus for spreading out a plurality of filaments. 4,637,104, Cl. 28-283.000.

Merck & Co., Inc.: *See*—
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Kelly, Stephen M., 4,637,897, Cl. 252-299.630.

Mergen, Mark F.: *See*—
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.

Merger, Franz: *See*—
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.

Merkel, Kurt E.: *See*—
Hershberger, Charles L.; Merkel, Kurt E.; Weeks, Robert E.; and Wild, Gene M., 4,637,981, Cl. 435-75.000.

Merki, Josef: *See*—
Brem, Ernst; and Merki, Josef, 4,638,199, Cl. 310-91.000.

Merry, Rodney J.: *See*—
Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., 4,637,749, Cl. 403-322.000.

Merryman, Ora S. Cleaning solution. 4,637,892, Cl. 252-139.000.

Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., to Union Carbide Corporation. Ceramic composition and process for use thereof. 4,638,029, Cl. 524-430.000.

Meseltron SA: *See*—
Sigg, Hans, 4,637,169, Cl. 51-165.770.

Messer Griesheim GmbH: *See*—
Donath, Sabine; and Holz, Peter, 4,637,174, Cl. 51-425.000.

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Grossler, Peter; and Nissl, Norbert, 4,638,130, Cl. 200-61.45R.

Metallgesellschaft, A.G.: *See*—
Rausch, Werner; and Mueller, Gerhard, 4,637,838, Cl. 148-6.15Z.

Metromedia, Inc.: *See*—
Logan, David J., 4,638,373, Cl. 358-298.000.

Metz, Laurens, to Polynorm, N.V. Frame for door or window opening. 4,637,183, Cl. 52-217.000.

Metz, Pierre, to Thomson Brandt Armements. Gas propellor for guided missile. 4,637,572, Cl. 244-3.220.

Meyer, Martin S.: *See*—
Eesley, Gary L.; Mance, Andrew M.; and Meyer, Martin S., 4,637,862, Cl. 204-15.000.

Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,638,105, Cl. 585-481.000.

Mich, Thomas F.: *See*—
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.

Michaux, Jacques M., to Sacilor. Fully universal rolling process for H or I-beam type metal sections. 4,637,241, Cl. 72-225.000.

Michna, Martin: *See*—
Herd, Karl J.; and Michna, Martin, 4,638,054, Cl. 534-637.000.

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Ray, Andrew I. A., 4,637,393, Cl. 128-305.000.

Middlebrook, Robert B.; and Turner, W. Bard. Vehicular movement indicator safety system. 4,638,295, Cl. 340-73.000.

Middleton, Francisco A.: *See*—
Hargrave, Franklin; and Middleton, Francisco A., 4,638,124, Cl. 379-159.000.

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Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., 4,637,950, Cl. 428-168.000.

Mielonen, Pekka A., to Oy Wartsila AB. Cartridge lock. 4,637,234, Cl. 70-34.000.

Migliore-Samour, Daniele: *See*—
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Milch, James R., to Eastman Kodak Company. Multiple exposure of area image sensor having a sparse array of elements. 4,638,371, Cl. 358-293.000.

Miles Laboratories, Inc.: *See*—
Pancham, Nazreen, 4,637,932, Cl. 424-101.000.
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, 4,637,979, Cl. 435-19.000.

Miller, Donald E., to Genicom Corporation. Automatic mechanical resonant frequency detector and driver for shuttle printer mechanism. 4,637,307, Cl. 101-93.040.

Miller, Ellsworth S., to Lectron Products, Inc. Electrical pressure switch. 4,638,132, Cl. 200-81.00R.

Miller, George A.: *See*—
Wise, Dan S.; and Miller, George A., 4,637,096, Cl. 19-200.000.

Miller, John R.: *See*—
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, 4,637,869, Cl. 204-192.110.

Miller, Michael J., to Advanced Micro Devices, Inc. Central processing unit having built-in BCD operation. 4,638,300, Cl. 340-347.0DD.

Miller, Paul H.: *See*—
Graham, Merton J.; and Miller, Paul H., 4,637,620, Cl. 279-1.0DA.

Milliard, Norman L.: *See*—
Coburn, Richard J.; Dean, Walter C., III; Kegelman, Thomas D.; and Milliard, Norman L., 4,638,339, Cl. 346-153.100.

Milliser, John, to Textron Inc. Clinch type fastener. 4,637,766, Cl. 411-180.000.

Mills, David; Lindahl, Anthony T.; and Kington, Alan D., to Rolls-Royce Limited. Component casting. 4,637,449, Cl. 164-132.000.

Mills, David R.: *See*—
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., 4,638,396, Cl. 361-101.000.

Milton, James L.: *See*—
Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., 4,638,274, Cl. 335-52.000.

Milton, Ronald I., to United States of America, Navy. Electromechanical power source. 4,638,173, Cl. 290-52.000.

Min, Byung-Woo. Burglar alarm built in car stereo. 4,638,293, Cl. 340-63.000.

Minialoff, Andrew J.: *See*—
Minialoff, Gerrard O.; Minialoff, Martin J.; and Minialoff, Andrew J., 4,637,190, Cl. 52-579.000.

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Minialoff, Gerrard O.; Minialoff, Martin J.; and Minialoff, Andrew J., 4,637,190, Cl. 52-579.000.

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Fukuda, Tsuguo; and Terashima, Kazutaka, 4,637,854, Cl. 156-607.000.

Minnesota Mining & Manufacturing Company: *See*—
Archibald, G. Kent; and Slaker, Frank A., 4,637,817, Cl. 604-81.000.
Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., 4,637,950, Cl. 428-168.000.
Hammar, W. James, 4,638,040, Cl. 526-245.000.
Larson, Wayne K.; and Hedrick, Steven T., 4,638,017, Cl. 521-157.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishimura, Toshihiko; and Maekawa, Yukio, 4,637,704, Cl. 354-286.000.
Naruse, Kazuhiko; and Yuasa, Yoshio, 4,637,721, Cl. 356-215.000.

Minten, Karl; and Krug, William, to Gould Inc. Gas monitoring device and method. 4,637,987, Cl. 436-151.000.

Mirbeth, Rudolph: *See*—
Jenzsch, Gunter; Rauh, Kurt; and Wegscheider, Hans J., 4,637,558, Cl. 241-79.000.

Miseyko, George; Peck, Walter R.; and Chase, Ronald G., to Stencel Aero Engineering Corp. Discard assembly for parachute deployment mechanism. 4,637,577, Cl. 244-147.000.

Miahima, Yasuhiro; Makibayashi, Katsunori; and Kuwayama, Kiyoaki, to Toyota Jidosha Kabushiki Kaisha; and Chuohatsujyo Kabushiki Kaisha. Leaf spring assembly. 4,637,595, Cl. 267-52.000.

Misumi, Teruo: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.

Mitchell, Gregory N.; and Wilson, Ronald A., to United States of America, Navy. Drag stabilizer. 4,637,570, Cl. 244-1.0TD.

Mitchell, Peter W. D., to Union Camp Corporation. Preparation of delta-terpineol. 4,638,103, Cl. 568-827.000.

Mitchell, Peter W. D., to Union Camp Corporation. Preparation of terpinen-4-ols and intermediates. 4,638,104, Cl. 568-827.000.

Mitchell, Vance C., to ICL Scientific Corp. Microscope inspection slide. 4,637,693, Cl. 350-536.000.

Mitomi, Mitsuo: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
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Hayakawa, Masaharu, 4,638,394, Cl. 360-137.000.
Hirano, Ryoichi, 4,637,845, Cl. 148-171.000.
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Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, 4,638,109, Cl. 136-244.000.
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Nakamura, Koji, 4,638,212, Cl. 313-408.000.
Sakuma, Hisayuki; and Hoshinouchi, Susumu, 4,638,145, Cl. 219-121.0LU.
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Mitsui Toatsu Chemicals, Inc.: *See*—
Shimuzu, Yoshiro; and Tada, Yoshio, 4,637,964, Cl. 428-694.000.

Mitutoyo Mfg. Co., Ltd.: *See*—
Kuwabara, Yoshiharu; and Hamada, Hiroyoshi, 4,637,680, Cl. 350-6.800.

Miura, Masatoshi: *See*—
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Miura, Yukio; and Miyamoto, Yoshikazu, to Tokico Ltd. Control system for controlling the supply of a predetermined quantity of fluid. 4,637,525, Cl. 222-22.000.

Mixed Bag Imports, Inc.: *See*—
Weigert, Hans, 4,638,412, Cl. 362-156.000.

Miyamae, Hiroshi; and Banno, Makoto, to Konishiroku Photo Industry Co., Ltd. Telecentric zoom lens system. 4,637,690, Cl. 350-427.000.

Miyamoto, Kiyoshi, to Omron Tateisi Electronics Co. Proximity switch with improved response time and antimagnetic field circuitry. 4,638,262, Cl. 331-65.000.

Miyamoto, Yoshikazu: *See*—
Miura, Yukio; and Miyamoto, Yoshikazu, 4,637,525, Cl. 222-22.000.

Miyashita, Kunio: *See*—
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Miyauchi, Yasushi: *See*—
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.

Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, to Agency of Industrial Science and Technology; and Oiles Industry Co., LTD. Sliding member of graphite-boron carbides. 4,637,884, Cl. 252-12.000.

Miyazaki, Michio: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.

Mizoguchi, Hideo. Automatic feed device for a facing head. 4,637,285, Cl. 82-2.00E.

Mizoguchi, Shoichi, to NEC Corporation. Automatic adaptive equalizer. 4,638,495, Cl. 375-14.000.

Mizuno, Toshiaki: *See*—
Abe, Shinichi; and Mizuno, Toshiaki, 4,637,364, Cl. 123-492.000.

Mizutani, Yoshihisa, to Kabushiki Kaisha Toshiba. Method of producing semiconductor device. 4,637,128, Cl. 29-576.00B.

Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,638,105, Cl. 585-481.000.
Odeh, Aziz S., 4,638,447, Cl. 364-556.000.
Szostak, Rosemarie, 4,637,923, Cl. 423-328.000.
Uhri, Duane C., 4,638,254, Cl. 324-323.000.

Mochida, Haruo; and Namazue, Hirotoshi, to Nissan Motor Company, Limited; and Kokusan Kinzoku Kogyo. Theft prevention system in an automotive keyless entry system with automatic door locking. 4,638,292, Cl. 340-63.000.

Mochizuki, Toshio: *See*—
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Mockovciak, John, Jr.: *See*—
Frank, Arthur M.; DeRespinis, Silvio F.; and Mockovciak, John, Jr., 4,637,447, Cl. 160-265.000.

Moehling, Charles; and Henkel, James A., to Amsted Industries Incorporated. Bolster friction shoe pocket. 4,637,319, Cl. 105-207.000.

Moen, Carl J., to Beloit Corporation. Three-way valve for an attenuator. 4,637,434, Cl. 137-625.660.

Mogol, Gerald M.; and Fox, Leo E. Simulated log-burning fireplace. 4,637,372, Cl. 126-127.000.

Mohr, Reinhard: *See*—
Neeb, Rudolf; and Mohr, Reinhard, 4,638,053, Cl. 534-589.000.

Moinard, Patrice: *See*—
Perrin, Alain; and Moinard, Patrice, 4,637,747, Cl. 403-23.000.

Moja, Egidio A.; and Gessa, Gianluigi, to Boehringer Biochemia Robin S.p.A. Dietetic supplement and prepackaged food in which it is contained, process of preparation and method of administration. 4,638,013, Cl. 514-561.000.

Molnlycke Konsumentprodukter AB: *See*—
Bergenwall, Henning, 4,637,652, Cl. 297-90.000.

Monforte, Mathew L., to Monforte Robotics, Inc. Robotic collision sensors and compliance devices. 4,638,231, Cl. 318-640.000.

Monforte Robotics, Inc.: *See*—
Monforte, Mathew L., 4,638,231, Cl. 318-640.000.

Monnais, Christian; and Cotteret, Jean, to L'Oreal. Tinctorial composition for keratin fibres, based on nitrated benzene dyestuffs. 4,637,821, Cl. 8-415.000.

Monolithic Memories, Inc.: *See*—
Chan, Andrew K., 4,638,243, Cl. 324-51.000.
Geannopoulos, George; Tsui, Cyrus; Fitzpatrick, Mark; and Chan, Andy, 4,638,189, Cl. 307-465.000.

Monsanto Company: *See*—
Walker, George E., 4,637,944, Cl. 428-35.000.

Montandon, Daniel, to Nirvana Espar Systems, S.A. Roller furling element for boats equipped with sails. 4,637,334, Cl. 114-106.000.

Montefina, S.A.: *See*—
Bertrand, Jean-Noel M., 4,638,015, Cl. 521-85.000.

Montres Rado S.A.: *See*—
Gogniat, Paul, 4,637,734, Cl. 368-294.000.

Moon, James B.: *See*—
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., 4,638,313, Cl. 340-825.520.

Moon, Stephen H.: *See*—
Ingrisano, Louis A.; Moon, Stephen H.; and English, Lawrence J., 4,637,075, Cl. 2-94.000.

Moore, Jack M.: *See*—
Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., 4,637,848, Cl. 149-21.000.

Moore, Jerry; and Yanglin, Dennis W., to New World Manufacturing, Inc. Waterbed with removable side cushions. 4,637,082, Cl. 5-452.000.

Moore, William J. M.: *See*—
So, Eddy; and Moore, William J. M., 4,638,302, Cl. 340-347.0DA.

Morgan, Charles L., III. Probeless fluid level controller. 4,637,424, Cl. 137-392.000.

Morgan Construction Company: *See*—
Koelling, Robert K., Sr., 4,637,807, Cl. 464-135.000.

Mori, Akinori, to Sumitomo Electric Industries, Ltd. Shielded electric wires. 4,638,114, Cl. 174-36.000.

Mori, Kinya: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Mori, Masahito: *See*—
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Mori, Michio: *See*—
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Mori, Takasuke: *See*—
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Mori, Yoshikazu: *See*—
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Moriguchi, Haruhiko: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, to Hitachi, Ltd. Method and apparatus therefor in motor speed control. 4,638,225, Cl. 318-341.000.

Morisaka, Manabu: *See*—
Yoshikawa, Hayato; and Morisaka, Manabu, 4,637,298, Cl. 98-2.080.

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Moroux, Julien, to Societe Francaise d'Organo-Synthese. Method of oxidizing hydrazo compounds to corresponding azo compounds by hydrogen peroxide. 4,637,868, Cl. 204-157.820.

Morrow, David L.: *See*—
Fotheringham, James R.; and Morrow, David L., 4,637,488, Cl. 180-253.000.

Moss, Gaylord E.; Chern, Mao-Jin; and Dobbs, Teena L., to Hughes Aircraft Company. Holographic laser protection device. 4,637,678, Cl. 350-3.700.

Mossman, Allen B., to Amoco Corporation. Catalytic etherification of phenols to alkyl aryl ethers. 4,638,098, Cl. 568-630.000.

Motoki, Yasunari; and Ohkuma, Yuji, to Fujitsu Limited. Spin dryer. 4,637,146, Cl. 34-58.000.

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Motorola, Inc.: *See*—
Ballard, Danny B., 4,638,423, Cl. 364-200.000.
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.
Lunn, Gerald K.; Main, W. Eric; and McGinn, Michael, 4,638,265, Cl. 333-214.000.
McLaughlin, Kevin L., 4,638,186, Cl. 307-446.000.
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., 4,638,396, Cl. 361-101.000.
Samson, Robert, 4,638,406, Cl. 361-403.000.
Wagner, David J., 4,638,290, Cl. 340-56.000.

MotorTech, Inc.: *See*—
Yunick, Henry, 4,637,365, Cl. 123-545.000.

Motoyama, Tadashi, to Sony Corporation. Video signal recording and reproducing apparatus. 4,638,375, Cl. 358-338.000.

Motter Printing Press Co.: *See*—
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Moyle, Gordon A.: *See*—
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., 4,638,313, Cl. 340-825.520.
Mozer, Daniel S. Machine for coring stumps. 4,637,442, Cl. 144-2.00N.
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Mueller, Herbert, to BASF Aktiengesellschaft. Reducing the content of cyclic oligomeric ethers in polytetramethylene ether glycols or polyoxybutylene polyoxyalkylene glycols. 4,638,097, Cl. 568-617.000.
Mueller, Wolfgang: *See*—
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Mukai, Takashi: *See*—
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Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, to Alps Electric Co., Ltd. Composition for sliding contact part of recording/reproducing apparatus. 4,638,387, Cl. 360-122.000.
Mukasa, Koichi: *See*—
Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, 4,638,391, Cl. 360-125.000.
Mukli, Glenn A.; Frew, Paul C.; and Mills, David R., to Motorola, Inc. Intrinsically safe battery circuit. 4,638,396, Cl. 361-101.000.
Mullenix, Kenneth E.: *See*—
Troy, Seymour L.; and Mullenix, Kenneth E., 4,637,634, Cl. 283-98.000.
Mullett Associates, Inc.: *See*—
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Muniesa, Jacques: *See*—
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Muramoto, Takumi: *See*—
Okino, Kiyomi; and Muramoto, Takumi, 4,637,648, Cl. 296-63.000.
Murase, Shigemitsu, to Unitika Limited. Finish composition for polyester fiber for rubber reinforcement. 4,637,957, Cl. 428-395.000.
Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, to Toyoda Koki Kabushiki Kaisha. Pallet changer. 4,637,108, Cl. 29-33.00P.
Murata, Tomohiro: *See*—
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Murayama, Tomio: *See*—
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.
Murphy, James L.: *See*—
Jones, Charles; Murphy, James L.; and Burks, Kenneth, 4,637,732, Cl. 368-109.000.
Murray, Alan A. Shopping guide device and the like. 4,637,337, Cl. 116-323.000.
Murray, William J.; and Earle, George A., III, to LTV Aerospace and Defense Company. Automated tool positioning system. 4,637,761, Cl. 408-16.000.
Musgrave, Dwight S.: *See*—
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Musso, Pietro: *See*—
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Mydax, Inc.: *See*—
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Myllyla, Risto: *See*—
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Nagamori, Hiroyuki: *See*—
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.
Nagano, Masashi, to Shimano Industrial Company Limited. Bicycle brake operating device positioned on a drop handle. 4,637,273, Cl. 74-489.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,637,809, Cl. 474-80.000.
Nagaoka, Shigenori: *See*—
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Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Illuminating means for color image sensing. 4,638,353, Cl. 358-98.000.
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Nagasawa, Kenichi: *See*—
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Nagasawa, Kouichi: *See*—
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Nagase Sangyo Kabushiki Kaisha: *See*—
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Nagle, Richard T., to Power Alcohol, Inc. Methods of hydrolyzing cellulose to glucose and other (poly)saccharides. 4,637,835, Cl. 127-37.000.
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, to Kokusai Denshin Denwa Kabushiki Kaisha. Load platform and transport track system for the transport of passenger baggage and parcels as air freight. 4,637,315, Cl. 104-135.000.
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Nakada, Fumio: *See*—
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, 4,637,767, Cl. 411-411.000.
Nakagawa, Akira: *See*—
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Nakai, Mamoru; and Enomiya, Takuji, to Ube Industries, Ltd. Process for producing phenylacetones. 4,638,094, Cl. 568-309.000.
Nakamura, Genshiro: *See*—
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Nakamura, Hiroshi; Toyama, Osamu; and Kanii, Norikazu, to Toyoda Koki Kabushiki Kaisha. Industrial robot. 4,637,774, Cl. 414-735.000.
Nakamura, Joji: *See*—
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Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, to Toyota Jidosha Kabushiki Kaisha. Traction control device of a motor vehicle. 4,637,487, Cl. 180-197.000.
Nakamura, Koji, to Mitsubishi Denki Kabushiki Kaisha. Color cathode-ray tube. 4,638,212, Cl. 313-408.000.
Nakamura, Kouzaburou: *See*—
Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, 4,637,939, Cl. 427-162.000.
Nakamura, Mitsuo: *See*—
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Nakamura, Norio: *See*—
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Nakamura, Shizuo, to Kawamura Cycle Co., Ltd. Bicycle rear derailleur. 4,637,808, Cl. 474-80.000.
Nakamura, Shunji: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.
Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-oxabicycloheptane α-substituted ketone prostaglandin analogs useful in the treatment of thrombotic disease. 4,638,012, Cl. 514-469.000.
Nakase, Hiroshi: *See*—
Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, 4,638,477, Cl. 370-94.000.
Nakashima, Keishi: *See*—
Hatanai, Takashi; Nakashima, Keishi; and Mukasa, Koichi, 4,638,391, Cl. 360-125.000.
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,638,387, Cl. 360-122.000.
Nakashima, Kunimichi: *See*—
Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, 4,637,108, Cl. 29-33.00P.
Nakashima, Seiichiro; Toyoda, Kenichi; Torii, Nobutoshi; and Nihei, Ryo, to Fanuc Ltd. Industrial robot of the articulated arm type. 4,637,773, Cl. 414-732.000.
Nakatani, Masaki; and Hiraga, Yoichi, to Toyo Soda Manufacturing Co., Ltd. Method for removing organic materials from a wet process phosphoric acid. 4,637,922, Cl. 423-321.00R.
Nakaya, Yasuhiro: *See*—
Asai, Toshio; and Nakaya, Yasuhiro, 4,637,399, Cl. 128-639.000.
Nakayama, Ryoichi: *See*—
Iida, Hitoshi; and Nakayama, Ryoichi, 4,637,494, Cl. 187-10.000.
Nakayama, Satoshi: *See*—
Sakura, Yasuhiro; Nimura, Hitoshi; and Nakayama, Satoshi, 4,638,332, Cl. 346-76.0PH.
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, to Fuji-Xerox Co. Ltd. Thermal recording method and apparatus. 4,638,329, Cl. 346-76.0PH.
Nakazawa, Takashi: *See*—
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.
Namazue, Hirotoshi: *See*—
Mochida, Haruo; and Namazue, Hirotoshi, 4,638,292, Cl. 340-63.000.
Namekawa, Satoshi: *See*—
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Naniwa Products Co., Ltd.: *See—*
Kawai, Kazuo; Kawai, Sumikazu; and Katashima, Seiji, 4,637,450, Cl. 164-200.000.
Nanne, Johannes M.: *See—*
van Erp, Willibrord A.; Nanne, Johannes M.; and Post, Martin F. M., 4,637,993, Cl. 502-242.000.
Narita, Kiichi: *See—*
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Naruse, Kazuhiko; and Yuasa, Yoshio, to Minolta Camera Kabushiki Kaisha. Light measuring device. 4,637,721, Cl. 356-215.000.
Naruse, Yuji: *See—*
Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, 4,637,866, Cl. 204-129.000.
Nash, Dudley O., to United States of America, Air Force. Dual material exhaust nozzle flap. 4,637,550, Cl. 239-265.370.
Nath, Prem: *See—*
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National Distillers and Chemical Corporation: *See—*
McClain, Dorothee M., 4,638,034, Cl. 525-369.000.
National Product Marketing: *See—*
Partus, Fred P.; and Jones, Michael A., 4,638,129, Cl. 200-43.220.
National Research Development Corporation: *See—*
Foster, Peter R., 4,638,048, Cl. 530-380.000.
Sutherland, Ian W., 4,638,059, Cl. 536-121.000.
Nauchno-Issledovatelsky Institut Obschei i Neotlozhno Khirurgii: *See—*
Sorochenko, Oleg A., 4,637,390, Cl. 128-303.140.
NCR Corporation: *See—*
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.
Quinn, Bruce A.; and Barton, Scott N., 4,638,312, Cl. 340-825.350.
Nebelung, Hermann H.; Huber, Robert; and Futterknecht, Fritz, to Emhart Industries, Inc. Parison transferring means. 4,637,827, Cl. 65-235.000.
NEC Corporation: *See—*
Koike, Nobuhiko, 4,638,475, Cl. 370-60.000.
Mizoguchi, Shoichi, 4,638,495, Cl. 375-14.000.
Nishimura, Hiroyuki, 4,638,431, Cl. 364-200.000.
Neeb, Rudolf; and Mohr, Reinhard, to Hoechstaktiengesellschaft. Process for the preparation of chlorozincate salts of benzo thiazolium azo dyestuffs by alkylating with dialkylsulfate in aqueous medium in the presence of Zn-containing acid acceptor at pH≦7. 4,638,053, Cl. 534-389.000.
Neefe, Charles W. Gyroscopically stabilized spin cast machine. 4,637,791, Cl. 425-425.000.
Nees, Friedbert: *See—*
Broecker, Franz J.; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,638,085, Cl. 560-208.000.
Nelson, Marvin D.: *See—*
Dietiker, Paul; and Nelson, Marvin D., 4,637,429, Cl. 137-505.140.
Nelson, Norman A., to Upjohn Company, The. Aromatic or inter-oxa 2-decarboxy-2-hydroxymethyl-PGFα compounds. 4,638,100, Cl. 568-645.000.
Nelson, Robert F.: *See—*
Uba, Toshio; and Nelson, Robert F., 4,637,966, Cl. 429-57.000.
Netolicky, Charles E.: *See—*
Dvorak, Robert F.; and Netolicky, Charles E., 4,638,133, Cl. 200-302.100.
Netznik, Frederick P. Cushion fabrication apparatus. 4,637,789, Cl. 425-89.000.
Neumann, Hans J.: *See—*
Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., 4,637,119, Cl. 29-568.000.
Neupauer, Helmut, to Siemens Aktiengesellschaft. Method and apparatus for resumption of normal operation of a high-voltage D. C. transmission line. 4,638,415, Cl. 363-35.000.
Neupauer, Helmut; Kaufhold, Wolfgang; and Wild, Georg, to Siemens Aktiengesellschaft. Method and apparatus for high-voltage D.C. transmission with a bypass circuit for malfunctions. 4,638,416, Cl. 363-35.000.
Nevalainen, Kyosti; and Martikainen, Kaarlo, to Oy Wartsila Ab. Cylinder lock. 4,637,240, Cl. 70-366.000.
New, Richard W.: *See—*
Johnson, Charles E.; and New, Richard W., 4,637,511, Cl. 198-846.000.
New World Manufacturing, Inc.: *See—*
Moore, Jerry; and Yanglin, Dennis W., 4,637,082, Cl. 5-452.000.
Neway Manufacturing, Inc.: *See—*
Acker, Franklin L., 4,637,762, Cl. 408-203.500.
Newman, Walter: *See—*
Johnson, George E.; and Newman, Walter, 4,637,671, Cl. 339-50.00R.
Ney, Robert, to Lynenwerk GmbH & Co. Kommanditgesellschaft. Electrical cable for communication purposes. 4,638,117, Cl. 174-117.00F.
NGK Spark Plug Co., Ltd.: *See—*
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.
Watanabe, Masakazu; and Okuno, Akiyasu, 4,638,268, Cl. 333-22.00F.
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., to General Electric Company, p.l.c., The. Apparatus for controlling the transfer of interrupt signals in data processors. 4,638,432, Cl. 364-200.000.
Nicely, Charles W., to United Steel & Wire Company. Corner structure for adjustable shelving (with opposed clamping members). 4,637,323, Cl. 108-107.000.
Nichols, Jeffrey B.: *See—*
Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.
Nichols, Leo F., to Enron Corp. Reactive gas sensor. 4,638,286, Cl. 338-34.000.
Nichols, Roy L.: *See—*
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Nicolin, Johannes: *See—*
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Nieder, Erin G., to Atlantic Research Corporation. Chemical passivation of amorphous boron powder. 4,637,847, Cl. 149-6.000.
Nield, Eric: *See—*
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Nielson, Albert E.: *See—*
Griffith, Carroll L.; and Nielson, Albert E., 4,637,305, Cl. 99-481.000.
Nifco Inc.: *See—*
Omata, Nobuaki, 4,637,765, Cl. 411-41.000.
Niggemann, Richard E., to Sundstrand Corporation. Heat exchanger. 4,637,456, Cl. 165-104.330.
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Nakashima, Seiichiro; Toyoda, Kenichi; Torii, Nobutoshi; and Nihei, Ryo, 4,637,773, Cl. 414-732.000.
Nihon Denshizairyo Kabushiki Kaisha: *See—*
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.
Nihon Parkerizing Co., Ltd.: *See—*
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.
Niinuma, Atsuo: *See—*
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Nilssen, Ole K. Protector for series-excited parallel-loaded resonant circuit. 4,638,395, Cl. 361-93.000.
Nilsson, Berndt R. Arrangement in Venetian blinds. 4,637,445, Cl. 160-178.00C.
Nimlok Limited: *See—*
Nimmo, Neil D.; Kenny, Michael; and Willis, David, 4,637,178, Cl. 52-36.000.
Nimmo, Neil D.; Kenny, Michael; and Willis, David, to Nimlok Limited. Screen assembly and clip therefor. 4,637,178, Cl. 52-36.000.
Nimura, Hitoshi: *See—*
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Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, to Sony Corporation. Magnetic recording medium. 4,637,959, Cl. 428-425.900.
Nippon A B S, Ltd.: *See—*
Arikawa, Tetsuro, 4,637,664, Cl. 303-111.000.
Nippon Chem-Con Corp.: *See—*
Iwanaka, Masaya; and Kajiwara, Seiji, 4,637,489, Cl. 181-160.000.
Nippon Electric Co., Ltd.: *See—*
Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, 4,637,127, Cl. 29-576.00E.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kogaku K. K.: *See—*
Kazami, Kazuyuki; and Wakabayashi, Hiroshi, 4,637,702, Cl. 354-173.110.
Uehara, Makoto; and Hashimoto, Sumio, 4,637,691, Cl. 350-432.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Kuwamoto, Hiroshi; Nagamori, Hiroyuki; Mukai, Takashi; and Iwado, Shuichi, 4,637,885, Cl. 252-32.500.
Nippon Notion Kogyo Co., Ltd.: *See—*
Kasai, Kazumi, 4,637,099, Cl. 24-200.000.
Nippon Seiko Kabushiki Kaisha: *See—*
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Nippon Sheet Glass Co., Ltd.: *See—*
Yamamoto, Noboru; and Yamasaki, Tetsuya, 4,637,681, Cl. 350-96.120.
Nippon Soken, Inc.: *See—*
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Nippon Telegraph & Telephone Public Corporation: *See—*
Kobayashi, Kensuke; and Tazoh, Yasuo, 4,638,185, Cl. 307-352.000.
Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, 4,637,939, Cl. 427-162.000.
Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Konishi, Jin-emon, 4,637,996, Cl. 514-11.000.
Nippondenso Co., Ltd.: *See—*
Fujiwara, Kenichi; Asano, Hideo; Hasada, Eiichi; Makida, Kazuhisa; and Iida, Akinori, 4,637,222, Cl. 62-244.000.
Iwase, Takatoshi; and Nakagawa, Akira, 4,637,132, Cl. 29-726.000.
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Nirvana Espar Systems, S.A.: *See—*
Montandon, Daniel, 4,637,334, Cl. 114-106.000.
Nishi, Yoshitsugu; and Daigo, Yukitaka, to Somar Corporation. Front plate of X-ray film cassette. 4,638,501, Cl. 378-182.000.

Nishida, Mamoru: *See*—
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Nishikawa, Kohei: *See*—
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Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Gear shift controller for automatic transmission. 4,637,278, Cl. 74-866.000.
Nishikawa, Mikio: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,637,130, Cl. 29-588.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium and method for making. 4,637,963, Cl. 428-694.000.
Nishimura, Hiroyuki, to NEC Corporation. Data processing system for vector processing having a cache invalidation control unit. 4,638,431, Cl. 364-200.000.
Nishimura, Yuji; and Koide, Teruhiko, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing tension adjusting apparatus. 4,637,630, Cl. 280-807.000.
Nishino, Hiroyuki: *See*—
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Nitsuko Limited: *See*—
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Nittan Co., Ltd.: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, 4,638,304, Cl. 340-500.000.
Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
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Nitto Seiko Co., Ltd.: *See*—
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Niu, Joseph H. Y.; and Schmolka, Irving R., to BASF Corporation. Coal-oil slurries containing a surfactant. 4,637,822, Cl. 44-51.000.
Nixdorf Computer AG: *See*—
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Noble, Roger K.: *See*—
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Noda, Masaru; and Shiga, Toshihiro, to Hitachi, Ltd. Color video camera signal processing circuit. 4,638,352, Cl. 358-44.000.
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Nolan, John H.; and Nolan, William A. Magnetic valve. 4,637,427, Cl. 137-460.000.
Nolan, William A.: *See*—
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Nordin, Inge, to Pede AB. Stringtape roll for Venetian blinds. 4,637,105, Cl. 29-24.500.
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Nozoe, Toshiro; and Yamashita, Akira, to Matsushita Electric Industrial Co., Ltd. Sampling clock reproducing circuit. 4,638,358, Cl. 358-147.000.
Nunley, Allen, to Halliburton Company. Graded shaped spatial resolution nuclear detectors. 4,638,159, Cl. 250-267.000.
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Obara, Haruki; and Aso, Toshiyuki, to Fanuc Ltd. Apparatus for guiding a wire electrode of a wire electrode discharge machine. 4,638,140, Cl. 219-69.00W.
Obrecht, Georges; and Dreuilhe, Claude, to Alsthom. Azimuth measuring method for non-vertical drilling. 4,637,480, Cl. 175-45.000.
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, to Wistar Institute of Anatomy and Biology; and Research Corporation, a part interest. Monoclonal anti-ornithine decarboxylase antibody and method of producing same. 4,637,984, Cl. 435-240.000.
Oce-Nederland B.V.: *See*—
Bouwens, Jan M. M.; and Schiffelers, Hendrik E. P., 4,637,598, Cl. 271-3.100.
Ochsner, Rolf H., to Robertshaw Controls Company. Differential pressure operated electrical switch construction and method of making the same. 4,637,131, Cl. 29-622.000.
Odashima, Rou, to Sanshin Kogyo Kabushiki Kaisha; and Yamaha Hatsudoki Kabushiki Kaisha. Separate lubricating system for outboard motors. 4,637,355, Cl. 123-73.0AD.
Odeh, Aziz S., to Mobil Oil Corporation. Method for determining consistent oil relative permeability values from dynamic displacement data. 4,638,447, Cl. 364-556.000.
Office National d'Etudes et de Recherche Aerospatiales (ONERA): *See*—
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Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, to Hitachi, Ltd. Information recording system and method for using alternative record area in writing and reading of data on optical disk. 4,638,472, Cl. 369-54.000.
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Ogawa, Kenji, to Idemitsu Petrochemical Co., Ltd. Apparatus for folding web-shaped member. 4,637,812, Cl. 493-357.000.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Light receiving member having an amorphous silicon photoconductor. 4,637,972, Cl. 430-84.000.
Ogawa, Kyosuke: *See*—
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Ogawa, Nobuo: *See*—
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Ogura, Masahiko, to Kabushiki Kaisha Toshiba. Motor driving apparatus. 4,638,235, Cl. 318-696.000.
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Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, to Kanzaki Kokyukoki Mfg. Co. Ltd. Hydraulic system in working vehicles. 4,637,482, Cl. 180-132.000.
Ohba, Motoi: *See*—
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Ohkuma, Yuji: *See*—
Motoki, Yasunari; and Ohkuma, Yuji, 4,637,146, Cl. 34-58.000.

Ohmi, Masatoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Tappet arrangement for engine valve train. 4,637,357, Cl. 123-90.480.

Ohmori, Akira; Tomihashi, Nobuyuki; Inukai, Hiroshi; and Nakai, Kazuhiro, to Daikin Industries, Ltd. Fluorooxyalkyl vinyl ethers. 4,638,041, Cl. 526-247.000.

Ohmura, Yoshio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,637,998, Cl. 514-42.000.

Ohno, Hideo: *See*—
Konishi, Satoshi; Ohno, Hideo; Naruse, Yuji; and Yoshida, Hiroshi, 4,637,866, Cl. 204-129.000.

Ohshima, Yoshikuni: *See*—
Horibe, Youshun; Ohshima, Yoshikuni; and Masuda, Toyohiko, 4,637,350, Cl. 122-441.000.

Ohsumi, Hisayoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Resin-treated woody material. 4,637,954, Cl. 428-342.000.

Ohta, Takao: *See*—
Kuwabara, Hideo; and Ohta, Takao, 4,638,128, Cl. 200-33.00R.

Oikawa, Toshihiro: *See*—
Yano, Yoshiki; and Oikawa, Toshihiro, 4,637,358, Cl. 123-169.0PA.

Oiles Industry Co., LTD: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette having an improved braking mechanism. 4,638,393, Cl. 360-132.000.

Oiyama, Kiyokazu: *See*—
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,637,959, Cl. 428-425.900.

Oka, Takafumi: *See*—
Ogata, Mikito; Mori, Masahito; Doi, Takashi; Miyazaki, Michio; and Oka, Takafumi, 4,638,472, Cl. 369-54.000.

Okada, Jun; Kunimasa, Koichi; and Nakase, Hiroshi, to Hitachi, Ltd. Packet exchange data transmission system. 4,638,477, Cl. 370-94.000.

Okamoto, Hisao: *See*—
Kawamura, Kimihide; Horiguchi, Shojiro; and Okamoto, Hisao, 4,638,052, Cl. 534-575.000.

Okaniwa, Kazuhiro: *See*—
Ishihara, Takashi; Okaniwa, Kazuhiro; and Nakamura, Genshiro, 4,638,109, Cl. 136-244.000.

Okano, Kenji: *See*—
Hayashi, Seizo; Okano, Kenji; and Hayashi, Nobuhiro, 4,637,092, Cl. 15-319.000.

Okaya, Takuji: *See*—
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, 4,638,024, Cl. 524-22.000.

Okazaki, Masaki: *See*—
Kubodera, Seiiti; Hioki, Takanori; and Okazaki, Masaki, 4,637,975, Cl. 430-353.000.

Oki Electric Industry Co., Ltd.: *See*—
Kimura, Kikuo, 4,638,184, Cl. 307-297.000.

Okino, Kiyomi; and Muramoto, Takumi, to Mazda Motor Corporation; and Delta Kogyo Co., Ltd. Rear seat back locking arrangement for a motor vehicle and the like. 4,637,648, Cl. 296-63.000.

Oku, Seiji: *See*—
Itsuki, Fumiaki; and Oku, Seiji, 4,638,154, Cl. 250-227.000.

Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, to Nihon Denshizairyo Kabushiki Kaisha. Fused metal ion source with sintered metal head. 4,638,217, Cl. 315-111.810.

Okubo, Takesi: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Okumura, Yasuo: *See*—
Fujii, Haruki; Ikada, Shoji; Fukuda, Akimitsu; and Okumura, Yasuo, 4,637,840, Cl. 148-6.200.

Okumura, Yoshiharu: *See*—
Pieters, Wim J. M.; and Okumura, Yoshiharu, 4,638,106, Cl. 585-640.000.

Okuno, Akiyasu: *See*—
Watanabe, Masakazu; and Okuno, Akiyasu, 4,638,268, Cl. 333-22.00F.

Okura Electric Industry Co., Ltd.: *See*—
Okura, Masahiko; and Inayashi, Minoru, 4,637,098, Cl. 24-136.00R.

Okura, Masahiko; and Inayashi, Minoru, to Okura Electric Industry Co., Ltd. Shim used for cable clamp. 4,637,098, Cl. 24-136.00R.

Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, to Hitachi, Ltd. Process for fabricating semiconductor integrated circuit device. 4,637,124, Cl. 29-571.000.

Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, to SKF GmbH Schweinfurt. Bearing bushing for universal joints. 4,637,740, Cl. 384-425.000.

Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, to SKF GmbH. Arrangement for mounting swivel pin bearing in yoke of universal joint. 4,637,806, Cl. 464-130.000.

Olsen, Joseph C.; and Steinbach, Richard H., to Engineering Consulting Services. Safety mechanism for saws. 4,637,288, Cl. 83-375.000.

Olsson, Sven O. Spout with gate. 4,637,531, Cl. 222-559.000.

Olympus Optical Co., Ltd.: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,638,353, Cl. 358-98.000.
Sasa, Hiroyuki, 4,637,378, Cl. 128-4.000.

Omark Industries, Inc.: *See*—
Alexander, Kenneth L., 4,637,291, Cl. 86-23.000.

Omata, Nobuaki, to Nifco Inc. Two-piece expandable plastic rivet. 4,637,765, Cl. 411-41.000.

Omori, Takashi: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.

Omron Tateisi Electronics Co.: *See*—
Itsuki, Fumiaki; and Oku, Seiji, 4,638,154, Cl. 250-227.000.
Miyamoto, Kiyoshi, 4,638,262, Cl. 331-65.000.

Onishi, Kazumasa: *See*—
Mukasa, Koichi; Hatanai, Takashi; Nakashima, Keishi; and Onishi, Kazumasa, 4,638,387, Cl. 360-122.000.

Ono, Minoru; and Makino, Teruyoshi, to Fuji Photo Film Co., Ltd. Film pack. 4,637,703, Cl. 354-276.000.

Onoue, Akihiro: *See*—
Taguchi, Michihiro; and Onoue, Akihiro, 4,637,802, Cl. 440-75.000.

Ontario Cancer Institute, The: *See*—
Yaffe, Martin J., 4,638,502, Cl. 378-207.000.

Opprecht, Jurg: *See*—
Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, 4,637,521, Cl. 220-274.000.

Opprecht, Paul; Urech, Werner; and Opprecht, Jurg, to Elpatronic AG. Openable can body. 4,637,521, Cl. 220-274.000.

Orejola, Wilmo C. Surgical wound closures. 4,637,380, Cl. 128-334.00C.

Org, Tiit A.: *See*—
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.

Orlek, Barry S.: *See*—
Gaster, Laramie M.; and Orlek, Barry S., 4,638,066, Cl. 544-344.000.

Orrestad, Charles W.: *See*—
Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, 4,637,672, Cl. 339-61.00R.

Ortho Diagnostic Systems, Inc.: *See*—
Brown, Michael C.; and Kirchanski, Stefan J., 4,637,986, Cl. 436-10.000.

Ortho Pharmaceutical Corporation: *See*—
Kung, Patric C.; and Goldstein, Gideon, 4,637,983, Cl. 435-240.000.

Ortwein, Hermann; Krettek, Ottmar; and Nicolin, Johannes, to Clouth Gummiwerke Aktiengesellschaft. Wheel set for rail vehicles. 4,637,646, Cl. 295-37.000.

Osaka University: *See*—
Komatsu, Masao; and Fujita, Hiroshi, 4,637,927, Cl. 423-644.000.

Osakabe, Mitsuo, to Starting Industry Company Limited. Recoil starter. 4,637,360, Cl. 123-185.00A.

Osawa, Masao: *See*—
Kikuchi, Kunio; Kamada, Fujio; and Osawa, Masao, 4,637,508, Cl. 198-365.000.

Oscarsson, Rolf A.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.

Oshiage, Katsunori, to Nissan Motor Co., Ltd. Control system for motor vehicle with continuously variable transmission and engine. 4,637,280, Cl. 74-866.000.

Oshima, Mitsuaki; and Yamaguchi, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Solid-state image pickup device. 4,638,362, Cl. 358-213.000.

Osman, Robert M.; and Shulik, Larry J., to Exxon Research & Engineering Co. Catalytic gas synthesis apparatus. 4,637,918, Cl. 422-148.000.

Oswald, Klaus: *See*—
Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, 4,638,179, Cl. 307-10.0SB.

Otsuka, Hirofumi: *See*—
Takahashi, Tsuneo; and Otsuka, Hirofumi, 4,637,264, Cl. 73-862.330.

Ott, Granville E., to Texas Instruments Incorporated. Spatial light modulator drive system. 4,638,309, Cl. 340-752.000.

Otteson, Jack O., to Dana Corporation. Adjustable throttle connector for a vehicle speed control unit. 4,637,485, Cl. 180-175.000.

Otto, Lee W., to General Electric Company. Sandblasted incandescent lamps with an improved neck section. 4,638,208, Cl. 313-116.000.

Ouellette, William R.; Alcombright, Daniel S.; Carro, John J.; and Linman, E. Kelly, to Procter & Gamble Company, The. Macroscopically expanded three-dimensional polymeric web for transmitting both dynamically deposited and statically contacted fluids from one surface to the other. 4,637,819, Cl. 604-369.000.

Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, to Energy Conversion Devices, Inc. Gas mixtures for the vapor deposition of semiconductor material. 4,637,895, Cl. 252-188.310.

Ovshinsky, Stanford R.: *See—*
Lee, Henry; deNeufville, John P.; and Ovshinsky, Stanford R., 4,637,938, Cl. 427-53.100.

Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, to Lion Corporation. Method for forming a moisture barrier in a soil containing soluble salts. 4,637,759, Cl. 405-270.000.

Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., to Terra Tek, Inc.; and Geotechnical Resources Ltd. Rapid construction of ice structures with chemically treated sea water. 4,637,217, Cl. 62-74.000.

Owens, Brian T.; and Corona, Fredrick W., to Wallingford Barbell Company. Compact multiple purpose exercise bench. 4,637,608, Cl. 272-134.000.

Owens-Corning Fiberglas Corporation: *See—*
Crothers, Steven D., 4,637,188, Cl. 52-404.000.
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,638,490, Cl. 373-35.000.
Perkins, Richard A., 4,638,491, Cl. 373-39.000.
Shah, Hasmukh G.; and Musgrave, Dwight S., 4,637,946, Cl. 428-63.000.

Oxner, Clifford F. J., to Canada, Her Majesty the Queen in Right of. Jellyfish array. 4,637,490, Cl. 181-175.000.

Oy Wartsila AB: *See—*
Kyytsonen, Markku, 4,637,566, Cl. 242-56.00R.
Mielonen, Pekka A., 4,637,234, Cl. 70-34.000.
Nevalainen, Kyosti; and Martikainen, Kaarlo, 4,637,240, Cl. 70-366.000.

Oya, Yuichiro, to Sharp Kabushiki Kaisha. Microwave oven with door latching assembly. 4,638,136, Cl. 219-10.55C.

Ozawa, Hitoshi: *See—*
Matoba, Yoshiaki; and Ozawa, Hitoshi, 4,637,786, Cl. 418-55.000.

Pakula, Benjamin J., to Ford Motor Company. System for removal of water from diesel fuel systems. 4,637,351, Cl. 123-25.00J.

Palara, Sergio; and Torazzina, Aldo, to SGS-ATES Componenti Elettronici S.p.A. Audio amplifier switch-on control circuit. 4,638,507, Cl. 381-94.000.

Palin, Philip R.: *See—*
Callahan, Wayne B.; Koch, Harold O.; Palin, Philip R.; and Cook, James R., 4,638,056, Cl. 536-54.000.

Pallhorn, Sebald: *See—*
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich, 4,637,184, Cl. 52-220.000.

Palmberg, Paul W., to Perkin-Elmer Corporation, The. Apparatus and method for reducing topographical effects in an auger image. 4,638,446, Cl. 364-555.000.

PanCanadian Petroleum Limited: *See—*
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Pancham, Nazreen, to Miles Laboratories, Inc. Process for producing a concentrate enriched in coagulation factors VII and VIIa. 4,637,932, Cl. 424-101.000.

Paoli, Thomas L.: *See—*
Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., 4,638,334, Cl. 346-108.000.

Papst-Motoren GmbH & Co. KG: *See—*
von der Heide, Johann, 4,638,192, Cl. 310-12.000.

Parham, Thomas G.: *See—*
Beers, William W.; and Parham, Thomas G., 4,638,214, Cl. 313-487.000.

Parisch, Jochen; and Herlemann, Werner, to Daimler-Benz Aktiengesellschaft. Method for fastening a covering part at a frame part. 4,637,116, Cl. 29-441.00R.

Parisel, Jacques: *See—*
Fauvet, Jean-Pierre; and Parisel, Jacques, 4,638,419, Cl. 363-87.000.

Park, Noh-Aeok: *See—*
Irvine, Thomas F., Jr.; and Park, Noh-Aeok, 4,637,250, Cl. 73-57.000.

Parker, Fabienne: *See—*
Jolles, Pierre; Migliore-Samour, Daniele; Parker, Fabienne; and Casaretto, Monika, 4,637,997, Cl. 514-17.000.

Parkinson, Gerald W.: *See—*
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., 4,638,175, Cl. 307-64.000.

Parmigiani, Bruno: *See—*
Giorgio, Giancarlo; and Parmigiani, Bruno, 4,638,112, Cl. 174-22.00R.

Parsley, David W.: *See—*
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., 4,638,417, Cl. 363-41.000.

Partus, Fred P.; and Jones, Michael A., to National Product Marketing. Control switch cover. 4,638,129, Cl. 200-43.220.

Pasternak, Stephen F.; and Wohrstein, Franz X., to Peerless of America, Inc. Process of making heat exchangers. 4,637,111, Cl. 29-157.30A.

Patane, Joseph M.: *See—*
Inskip, Ervin B.; and Patane, Joseph M., 4,638,079, Cl. 560-4.000.

Patel, Arvind D.; and Salandanan, Carmelita S., to Dresser Industries, Inc. Fluid loss additives for oil base muds and low fluid loss compositions thereof. 4,637,883, Cl. 252-8.515.

Patel, Jayant: *See—*
Niblock, John A.; Patel, Jayant; Fisher, Dennis; and Lumb, Anthony P., 4,638,432, Cl. 364-200.000.

Paton, H. Neil. Swivelable single axle railcar truck and railcar. 4,637,318, Cl. 105-167.000.

Paton, H. Neil; and Skilling, John B. Articulated gondola railcar. 4,637,320, Cl. 105-406.100.

Pauker, Armando; and Preuit, Richard B., to Tandem Computers Incorporated. Base drive circuit for high-power switching transistor. 4,638,240, Cl. 323-289.000.

Pauly, Bernard: *See—*
Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, 4,637,573, Cl. 244-54.000.

Pavelka, Lee A.: *See—*
Bergeson, David L.; Pavelka, Lee A.; and Mielke, Barbara A., 4,637,950, Cl. 428-168.000.

Pechar, Henry W., Jr.; and Sproch, James D., to Standard Microsystems Corp. Virtual ground read only memory. 4,638,459, Cl. 365-104.000.

Peck, Walter R.: *See—*
Miseyko, George; Peck, Walter R.; and Chase, Ronald G., 4,637,577, Cl. 244-147.000.

Pede AB: *See—*
Nordin, Inge, 4,637,105, Cl. 29-24.500.

Peerless Machine & Tool Corporation: *See—*
Fortney, Joe L., 4,637,811, Cl. 493-167.000.

Peerless of America, Inc.: *See—*
Pasternak, Stephen F.; and Wohrstein, Franz X., 4,637,111, Cl. 29-157.30A.

Pegg, Anthony E.: *See—*
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, 4,637,984, Cl. 435-240.000.

Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., to Exxon Research and Engineering Company. Polyampholytes - high temperature viscosifiers for high ionic strength drilling fluids. 4,637,882, Cl. 252-8.514.

Pellinen, Markku; Malkki, Yrjo ; and Niskanen, Aimo, to Valtion Teknillinen Tutkimuskeskus. Method of growing edible mushrooms. 4,637,163, Cl. 47-1.100.

Pence, Jane R.: *See—*
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.

Pence, Jerry W.: *See—*
Beglin, Thomas W.; Pence, Jane R.; Kamionka, Harvey E.; and Pence, Jerry W., 4,638,424, Cl. 364-200.000.

Pencept, Inc.: *See—*
Blesser, Barry A.; and Prentice, Thomas C., 4,638,119, Cl. 178-19.000.

Penney, Bruce J., to Tektronix, Inc. Rectangular wave pulse generators. 4,638,255, Cl. 328-36.000.

Pennwalt Corporation: *See—*
Radice, Peter F., 4,638,207, Cl. 310-328.000.

Percec, Virgil, to B. F. Goodrich Company, The. Alternating block copolymers of polyarylene polyethers and process for their preparation. 4,638,039, Cl. 525-534.000.

Perichon, Christian: *See—*
Huet, Yves; and Perichon, Christian, 4,637,294, Cl. 91-536.000.

Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, to Societe Nationale des Poudres et Explosifs. Process for the electrosynthesis of alcohols and of epoxy compounds. 4,637,863, Cl. 204-59.00R.

Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, to Societe Nationale Industrielle Aerospatiale. Arrowlike aircraft wing equipped with a high-lift system and with a pylon for suspending the engine. 4,637,573, Cl. 244-54.000.

Perkin-Elmer Corporation, The: *See—*
Palmberg, Paul W., 4,638,446, Cl. 364-555.000.

Perkins, Charles V., to U.S. Philips Corporation. Adjusting the direction of a beam of radiation. 4,637,695, Cl. 350-631.000.

Perkins, David J., to Chrysler Motors Corporation. Anti-roll torsion bar arrangement for vehicle rear suspension. 4,637,628, Cl. 280-689.000.

Perkins, Richard A., to Owens-Corning Fiberglas Corporation. Method for protecting the heating electrodes of glass melting furnaces. 4,638,491, Cl. 373-39.000.

Perra, Raymond C.; Wilmot, Stephen B.; and Games, John E., to United Technologies Corporation. EAROM and EEPROM data storage management. 4,638,430, Cl. 364-300.000.

Perrella, Guido; and Thompson, William E., to DBM Industries Limited. Die casting mold. 4,637,451, Cl. 164-342.000.

Perri, Joseph A.: *See—*
La Bate, Michael D., II; and Perri, Joseph A., 4,637,592, Cl. 266-272.000.

Perrin, Alain; and Moinard, Patrice, to Societe Anonyme D.B.A. Device for mounting a protective cap on a support. 4,637,747, Cl. 403-23.000.

Pescetelli, Alessandro: *See—*
Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, 4,637,832, Cl. 75-109.000.

Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, to Quinton Instrument Company. Radiotransparent lead assembly for monitoring electrodes. 4,637,672, Cl. 339-61.00R.

Petermann, Harald; and Bauer, Peter, to GMN Georg Muller Nurnberg GmbH. Apparatus for spanning a center-opening saw blade. 4,637,369, Cl. 125-15.000.

Petersen, Robert E. Sewer check valve with cutting seat. 4,637,425, Cl. 137-412.000.

Peterson, Luetta M., to Mainstay, Inc. Bird feeder. 4,637,344, Cl. 119-52.00R.

Peterson, Paul F., to Lockheed Corporation. Rotary launcher system for an aircraft. 4,637,292, Cl. 89-1.804.

Petro-Canada Inc.: *See—*
Schramm, Laurier L., 4,637,417, Cl. 137-4.000.

Pfaffmann, George D., to Tocco, Inc. Method for heat treating ferrous parts. 4,637,844, Cl. 148-144.000.
Pfeffer, Hans-Rudolf: *See—*
Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, 4,637,958, Cl. 428-416.000.
Pfizer Inc.: *See—*
Richardson, Kenneth; and Whittle, Peter J., 4,638,007, Cl. 514-340.000.
Phenix, Douglas Michael: *See—*
Davis, Ronald G., 4,637,965, Cl. 429-1.000.
Phiffer, Leruy V.: *See—*
Kleffman, David R.; and Phiffer, Leroy V., 4,637,668, Cl. 339-10.000.
Philip Morris Incorporated: *See—*
Rainer, Norman B.; and McClung, Charles S., 4,637,408, Cl. 131-331.000.
Phillips, Emyr; and Holt, Brian, to Ciba-Geigy Corporation. Method of removing hydrogen sulphide from gases. 4,637,926, Cl. 423-573.00R.
Phillips Petroleum Company: *See—*
Battiste, David R.; and Harris, Jesse R., 4,637,991, Cl. 502-68.000.
Lindstrom, Merlin R.; and Mark, Harold W., 4,637,833, Cl. 106-14.130.
Shaw, James E.; and Westerman, John, 4,637,467, Cl. 166-295.000.
Phillips, William R.: *See—*
Holder, Donald W.; and Phillips, William R., 4,637,571, Cl. 244-3.160.
Physio-Control Corporation: *See—*
Jones, Paul W.; Merry, Rodney J.; and Linstad, Gregory A., 4,637,749, Cl. 403-322.000.
Piaggio & C. S.p.A.: *See—*
Gaddi, Bruno, 4,637,277, Cl. 74-865.000.
Piatt, John A.: *See—*
Shulenberger, Arthur M.; and Piatt, John A., 4,637,713, Cl. 355-76.000.
Piatt, Michael J.: *See—*
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., 4,638,325, Cl. 346-1.100.
Piche, Richard. Foodstuff slicer. 4,637,138, Cl. 30-114.000.
Pico Electronics Limited: *See—*
Campbell, David C., 4,638,299, Cl. 340-310.00A.
Picollo, August J. Reusable concrete curb inlet form. 4,637,585, Cl. 249-10.000.
Pierre, Charbonnel: *See—*
Leseure, Jean-Yves; Pierre, Charbonnel; and Laure, Christian, 4,638,167, Cl. 250-551.000.
Pieters, Wim J. M.; and Okumura, Yoshiharu, to Exxon Research & Engineering Co. Two stage process for improving the catalyst life of zeolites in the synthesis of lower olefins from alcohols and their ether derivatives. 4,638,106, Cl. 585-640.000.
Pietrasanta, Yves: *See—*
Bauduin, Gerard; Boutevin, Bernard; Deiss, Willy-Jean; and Pietrasanta, Yves, 4,638,018, Cl. 522-103.000.
Pilkington P.E. Limited: *See—*
Freeman, Michael H., 4,637,697, Cl. 351-161.000.
Pioneer Electronic Corporation: *See—*
Sawaki, Manabu, 4,638,222, Cl. 318-111.000.
Pirone, Vincent A., to RCA Corporation. Electrical discharge machine cooling fluid containment apparatus. 4,638,139, Cl. 219-69.00W.
Pissiotas, Georg: *See—*
Schurter, Rolf; and Pissiotas, Georg, 4,637,829, Cl. 71-90.000.
Pitney Bowes Inc.: *See—*
Daniels, Edward P., 4,638,439, Cl. 364-446.000.
Gavaghan, Thomas J.; Boucher, Paul D.; and Janatka, Karel, 4,637,602, Cl. 271-238.000.
Piuma, Adolfo, to VA.NI.M S.r.l. Process for the separation of metal compounds by reduction. 4,637,920, Cl. 423-67.000.
Plastic Oddities Inc.: *See—*
Izzi, Lewis B., Sr., 4,637,422, Cl. 137-360.000.
Plessey Overseas Limited: *See—*
Dakin, John P., 4,638,153, Cl. 250-227.000.
Plug-In Storage Systems, Inc.: *See—*
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, 4,638,399, Cl. 361-220.000.
Pober, Kenneth W.: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; and Pober, Kenneth W., 4,637,882, Cl. 252-8.514.
Polk Audio Inc.: *See—*
Polk, Matthew S.; and Campbell, Colin B., 4,638,505, Cl. 381-24.000.
Polk, Matthew S.; and Campbell, Colin B., to Polk Audio Inc. Optimized low frequency response of loudspeaker systems having main and sub-speakers. 4,638,505, Cl. 381-24.000.
Pollack, Jack, to Amtel, Inc. Offshore hydrocarbon production system. 4,637,335, Cl. 114-230.000.
Pollari, Theodore J., to Textron Inc. Self-priming diffuser type centrifugal pump. 4,637,778, Cl. 415-53.00R.
Poly-John Enterprises Corp.: *See—*
Harding, George W., 4,637,299, Cl. 98-29.000.
Polynorm, N.V.: *See—*
Metz, Laurens, 4,637,183, Cl. 52-217.000.
Pominville, Douglas A., to Atlantic Richfield Company. Paint detackification method. 4,637,824, Cl. 55-85.000.
Pons, Claude, to Videocolor. Apparatus for adjusting the position of a deflector on a television tube, particularly a color tube. 4,638,219, Cl. 315-368.000.
Ponstingl, Michael J.; Trump, Walter N.; and Kessler, Robert C., to Custom Sample Systems, Inc. Optical and electronically compared absorptiometer. 4,637,730, Cl. 356-411.000.
Porsche Aktiengesellschaft: *See—*
Schmid, Wolfgang, 4,637,363, Cl. 123-481.000.
Portex, Inc.: *See—*
Melendy, Clifford P., 4,637,388, Cl. 128-207.140.
Post, Martin F. M.: *See—*
van Erp, Willibrord A.; Nanne, Johannes M.; and Post, Martin F. M., 4,637,993, Cl. 502-242.000.
Potter, Troy J. Ventless liquid recovery system for pressurized gas lines. 4,637,440, Cl. 141-65.000.
Power Alcohol, Inc.: *See—*
Nagle, Richard T., 4,637,835, Cl. 127-37.000.
Powers, Frederick A.; and Gustafson, Thomas J. Pump seal with curved backup plate. 4,637,295, Cl. 92-170.000.
Powers, Hurshal G.: *See—*
Kirchner, Tommy L.; and Powers, Hurshal G., 4,637,718, Cl. 356-71.000.
PPG Industries, Inc.: *See—*
Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., 4,638,020, Cl. 523-406.000.
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., 4,637,956, Cl. 428-391.000.
Kwak, Won S.; and Hurditch, Rodney J., 4,637,698, Cl. 351-163.000.
Prazisions-Werkzeuge AG: *See—*
Walser, Felix, 4,637,339, Cl. 118-622.000.
Precision Mecanique Labinal: *See—*
Le Corre, Loic; and Rolland, Albert L., 4,638,200, Cl. 310-156.000.
Prentice, Thomas C.: *See—*
Blesser, Barry A.; and Prentice, Thomas C., 4,638,119, Cl. 178-19.000.
Prescant Pty. Limited: *See—*
Grayden, Paul A., 4,637,780, Cl. 417-68.000.
Preuit, Richard B.: *See—*
Pauker, Armando; and Preuit, Richard B., 4,638,240, Cl. 323-289.000.
Price, Robert: *See—*
Kartchner, Earl M.; Price, Robert; and Van Horn, Gary R., 4,638,494, Cl. 375-2.200.
Priest, Wayne A., to SOR, Inc. Pressure differential control mechanism. 4,637,258, Cl. 73-716.000.
Procter & Gamble Company, The: *See—*
Crabtree, Paul J.; and Imakawa, Kazuhiko, 4,637,890, Cl. 252-90.000.
Kirkpatrick, Steven J.; Zoller, Steven A.; and Woods, Daniel L., 4,637,935, Cl. 426-443.000.
Ouellette, William R.; Alcombright, Daniel S.; Curro, John J.; and Linman, E. Kelly, 4,637,819, Cl. 604-369.000.
Trokhan, Paul D., 4,637,859, Cl. 162-109.000.
PROGE: *See—*
Denimal, Philippe, 4,638,354, Cl. 358-106.000.
Progressive Tool & Industries Company: *See—*
Freeman, Herbert J., 4,637,133, Cl. 29-727.000.
Proizvodstvennoe Obiedinenie "Norma": *See—*
Teder, Leonid O.; Org, Tiit A.; Lauri, Vaino G.; and Aas, Ants J., 4,637,102, Cl. 24-642.000.
Propster, Mark A.: *See—*
Dunn, Charles S.; Propster, Mark A.; and Hohman, Charles M., 4,638,490, Cl. 373-35.000.
Proto-Power Corporation: *See—*
Baudro, Thomas O., 4,638,166, Cl. 250-515.100.
Pruitt, Martin E.; Case, Cecil L.; and Fritz, David P., to Hesston Corporation. Wide-cut windrower-conditioner having uniform crop distribution and conditioning. 4,637,201, Cl. 56-16.400.
Puisais, Xavier F.; Hamon, Jean-Pierre; Jegousse, Michel; and Kaluszynski, Michel, to TOTAL Compagnie Francaise des Petroles. Machine for electron-beam internal butt welding of tubes. 4,638,142, Cl. 219-121.0EC.
Pulse Electronics, Inc.: *See—*
Fernandez, Emilio A., 4,638,237, Cl. 320-48.000.
Puscasu, Boris, to Ford Motor Company. Sensor assembly for a radiator mounted coolant level monitoring system. 4,638,291, Cl. 340-59.000.
Quay, Steven C., to Salutar, Inc. Ferrioxamine-paramagnetic contrast agents for MR imaging, composition, apparatus and use. 4,637,929, Cl. 424-9.000.
Quercetti, Alessandro. Process for the manufacture of boxes, the boxes which result therefrom and the elements for their composition. 4,637,544, Cl. 229-44.00R.
Quinn, Bruce A.; and Barton, Scott N., to NCR Corporation. Order entry system including an interactive menu display. 4,638,312, Cl. 340-825.350.
Quinton Instrument Company: *See—*
Peterman, Stanley; Orrestad, Charles W.; and Iwanczuk, Paul, 4,637,672, Cl. 339-61.00R.
Quixote Corporation: *See—*
Rollhaus, Philip; and Endo, Yukio, 4,638,306, Cl. 340-365.00R.
R.F.J. Associates Limited: *See—*
Deczky, Andrew E., 4,638,441, Cl. 364-483.000.
Raab, Harald: *See—*
Gobel, Hilmar; and Raab, Harald, 4,637,500, Cl. 192-3.280.
Rabe, Karl L. G. Nail-type fastener, and process for manufacturing such fasteners. 4,637,768, Cl. 411-452.000.

Rabemanantsoa, Amelie: *See—*
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.
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Racz, Gabor B.; and Lewis, Royce C. Constant pressure tourniquet. 4,637,394, Cl. 128-327.000.
Radice, Peter F., to Pennwalt Corporation. Piezoelectric polymeric film balloon speaker. 4,638,207, Cl. 310-328.000.
Radin, George: *See—*
Chang, Albert; Cocke, John; Mergen, Mark F.; and Radin, George, 4,638,426, Cl. 364-200.000.
Radtke, Wolfgang; Borbely, Gyorgy; Pallhorn, Sebald; and Hollfritsch, Erich. Hollow floor. 4,637,184, Cl. 52-220.000.
Ragonese, Louis J.: *See—*
Hwang, Ying C.; Chen, Young K.; and Ragonese, Louis J., 4,638,190, Cl. 307-512.000.
Rai, Surinder S.: *See—*
Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., 4,638,187, Cl. 307-451.000.
Rainer, Norman B.; and McClung, Charles S., to Philip Morris Incorporated. Filter material for the removal of nitric oxide. 4,637,408, Cl. 131-331.000.
Raizon, Bernard; Rossey, Guy; and Wick, Alexander, to Synthelabo. Preparation of diphenylazomethines. 4,638,080, Cl. 560-35.000.
Rajeevakumar, Thekkemadathil V.; and Terman, Lewis M., to International Business Machines Corporation. Self-timed precharge circuit. 4,638,462, Cl. 365-203.000.
Ramsden, Gordon, to Whirlwind, Inc. Work presence controller. 4,637,289, Cl. 83-380.000.
Rand, Stephen C.; and DeShazer, Larry G., to Hughes Aircraft Company. Solid state laser employing diamond having color centers as a laser active material. 4,638,484, Cl. 372-42.000.
Ranjan, Radha K.: *See—*
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.
Rao, Chennupati K.; Arora, Sudershan K.; Grover, Raman; Durden, John A.; and D'Silva, Themistocles D. J., to Union Carbide Corporation. N-(alpha-haloacyl)-N-hydrocarbyl carbamoyl halides. 4,637,901, Cl. 260-544.00C.
Rassmann, Christoph: *See—*
Annipajo, Wolfgang; Breuer, Oswald; and Rassmann, Christoph, 4,637,658, Cl. 295-79.000.
Rathel, Dieter, to Webasto-Werk W. Baier GmbH & Co. Fuel-operated heating system, particularly an auxiliary heater for a vehicle. 4,637,371, Cl. 126-110.00B.
Raudat, John L.; and Thompson, Timothy H., to Standard-Knapp, Inc. Article grouper for case packer. 4,637,509, Cl. 198-425.000.
Rauh, Kurt: *See—*
Jenzsch, Gunter; Rauh, Kurt; and Wegscheider, Hans J., 4,637,558, Cl. 241-79.000.
Rausch, Werner; and Mueller, Gerhard, to Metallgesellschaft, A.G. Process for phosphating metals. 4,637,838, Cl. 148-6.15Z.
Raute Oy: *See—*
Eerola, Matti V., 4,637,599, Cl. 271-5.000.
Raven, Robert S., to Westinghouse Electric Corp. Rotor tip synthetic aperture radar. 4,638,315, Cl. 342-5.000.
Ravnitzky, Michael J., to Cornell Research Foundation, Inc. Parachute with leading-edge slats. 4,637,576, Cl. 244-145.000.
Ray, Andrew I. A., to Microsurgical Equipment Limited. Surgical instrument. 4,637,393, Cl. 128-305.000.
Ray, Charles A.; and Walker, Samuel C., to Anthony Manufacturing Corp. Releasable locking assembly for sprinkler valve units. 4,637,548, Cl. 239-201.000.
Raychem Corporation: *See—*
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.
Whitney, Wells, 4,638,150, Cl. 219-543.000.
Rayco Graphic Manufacturing, Inc.: *See—*
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Raynham Investments Limited: *See—*
Sanders, Bernard, 4,637,411, Cl. 132-9.000.
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Francis, Samuel A., 4,638,468, Cl. 367-153.000.
Razzell, Charles J. H.: *See—*
van Rumpt, Herman W.; and Razzell, Charles J. H., 4,638,263, Cl. 331-116.00R.
RCA Corporation: *See—*
Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., 4,638,360, Cl. 358-148.000.
Deal, Samuel B.; and Bartch, Donald W., 4,638,213, Cl. 313-479.000.
Deiss, Michael S., 4,638,181, Cl. 307-243.000.
Elabd, Hammam; and Kosonocky, Walter F., 4,638,345, Cl. 357-24.000.
Flatley, Doris W.; and Hsu, Sheng T., 4,637,836, Cl. 148-1.500.
McCandless, Harry E., 4,637,804, Cl. 445-36.000.
Pirone, Vincent A., 4,638,139, Cl. 219-69.00W.
Sinniger, Joseph O.; and Robbi, Anthony D., 4,638,498, Cl. 377-39.000.
RCA, Inc.: *See—*
Lightstone, Alexander W., 4,637,126, Cl. 29-572.000.
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L. Bubble oxygenator. 4,637,917, Cl. 422-46.000.
Rees, Elwyn. Data entry interface assembly. 4,638,422, Cl. 364-200.000.
Regie Nationale des Usines Renault: *See—*
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Rehmann, Robert, to EMS-Inventa AG. Method of, and apparatus for, increasing the energy in an electromagnetic fuze system. 4,637,311, Cl. 102-209.000.
Reichel, Curtis J.; Levis, William W., Jr.; and Hartman, Robert J., to BASF Corporation. Delayed co-initiation process for preparing polyol blends. 4,637,893, Cl. 252-182.000.
Reichel, Wolfgang: *See—*
Costa, Jorge; and Reichel, Wolfgang, 4,637,601, Cl. 271-160.000.
Reichelt, Achim: *See—*
Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, 4,637,682, Cl. 350-96.150.
Reid, Dennis D. Archimedian screw type spinner lure. 4,637,158, Cl. 43-42.190.
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, to Joyce International, Inc. Positive interlock for file cabinet. 4,637,667, Cl. 312-217.000.
Reinker, Joseph F., Jr.: *See—*
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,637,640, Cl. 285-319.000.
Remec, Matthew J. Thermal level detector for conductive or nonconductive liquids or gases. 4,638,288, Cl. 340-52.00F.
Renaut, Paul W.: *See—*
Archer, Wendel E.; Milton, James L.; Renaut, Paul W.; and Winquist, Nelson H., 4,638,274, Cl. 335-52.000.
Renga, James M.: *See—*
Wang, Pen-Chung; and Renga, James M., 4,638,064, Cl. 544-54.000.
Renix Electronique: *See—*
Bernard, Montaron; Claude, Lombard; Claude, Moyses; and Gerard, Catier, 4,637,246, Cl. 73-35.000.
Research Corporation: *See—*
Chang, Stephen S.; Ho, Chi-Tang; and Houlihan, Christopher M., 4,638,095, Cl. 568-326.000.
Clark, C. Randall, 4,638,014, Cl. 514-619.000.
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, 4,637,984, Cl. 435-240.000.
Resinoid Engineering Corporation: *See—*
Ebner, Howard A., 4,638,202, Cl. 310-235.000.
Reuschling, Dieter: *See—*
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,638,063, Cl. 544-2.000.
Reynolds, George A.: *See—*
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Reynolds Metals Company: *See—*
Gilliam, Edward C.; Jackson, John M.; and Lamie, Billy J., 4,637,260, Cl. 73-826.000.
Rhee, Chong-Kon; McKibben, David M.; and Bibbee, Jeffrey N., to Uniroyal Goodrich Tire Company, The. Test instrument. 4,637,252, Cl. 73-150.00A.
Rhodes, James A.: *See—*
Acock, George W., Jr., 4,637,176, Cl. 52-30.000.
Rhodes, Warren W.: *See—*
Ling, Hung C.; Rhodes, Warren W.; and Yan, Man F., 4,637,989, Cl. 501-135.000.
Riach, Richard L.: *See—*
England, John R.; and Riach, Richard L., 4,637,475, Cl. 173-43.000.
Ricchio, Dominic A. Apparatus for measurement of water conditions in a watermattress. 4,637,737, Cl. 374-141.000.
Rice, Billy J.: *See—*
Weathers, Gary G.; and Rice, Billy J., 4,637,470, Cl. 166-344.000.
Richards, Brian T., to Cadbury Limited. Apparatus for making a confection including a depositing means and conveyor carried molds. 4,637,788, Cl. 425-4.00R.
Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Triazole antifungal agents. 4,638,007, Cl. 514-340.000.
Richmond, Doug: *See—*
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.
Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr Aktiebolag. Reciprocal movable screens in a vertically elongated vessel. 4,637,878, Cl. 210-388.000.
Richter, Ole J.: *See—*
Richter, Johan C. F. C.; and Richter, Ole J., 4,637,878, Cl. 210-388.000.
Rickard, Dale A.; and Rudelis, Glen H., to International Business Machines Corporation. Dynamically selectable polarity latch. 4,638,183, Cl. 307-291.000.
Ricoh Company, Ltd.: *See—*
Funato, Hiroyoshi, 4,637,679, Cl. 350-6.500.
Iiyama, Kiyotaka; and Inaba, Norihiko, 4,638,340, Cl. 346-204.000.
Yuasa, Kazuhiro, 4,637,708, Cl. 355-3.0DD.
Ricouard, Jacques; and Chappoux, Claude, to Ronis S.A. Coin lock device for shopping trolleys. 4,637,507, Cl. 194-212.000.
Ridgely, Myron H.: *See—*
Foss, Janet M. P.; Foss, John; Brooks, Christopher G.; and Ridgely, Myron H., 4,637,626, Cl. 280-655.000.
Riemann, Achim; and Ude, Werner, to Rohm GmbH. Method for making 4,4'-dihydroxydiphenyl ether. 4,638,099, Cl. 568-638.000.
Rieter Machine Works Limited: *See—*
Schmid, Rene; and Krehl, Hermann, 4,637,565, Cl. 242-55.100.
Rikagaku Kenkyusho: *See—*
Idesawa, Masanori, 4,637,715, Cl. 356-1.000.

Ritchie, Frank. Controls for a game bike. 4,637,605, Cl. 272-73.000.

Ritter, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. New organic boron polymers and their use. 4,638,092, Cl. 568-1.000.

Rivkin, Bernard W. Semi-permanent filing, flagging and indexing system. 4,637,149, Cl. 40-2.00R.

RJB and C Company: *See*—
Baer, Robert J., 4,637,631, Cl. 281-15.00R.

Roba, Joseph: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.

Robbi, Anthony D.: *See*—
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Robert Bosch GmbH: *See*—
Berner, Erwin; and Zettel, Hans-Dieter, 4,637,196, Cl. 53-77.000.
Dreyer, Adolf; and Roozenbeek, Herman, 4,637,247, Cl. 73-35.000.
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,638,228, Cl. 318-569.000.
Kranzler, Ernst, 4,638,196, Cl. 310-50.000.
Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, 4,638,179, Cl. 307-10.0SB.
Sochor, Josef, 4,638,382, Cl. 360-68.000.

Roberts, Gerald L., to General Electric Company. Clothes washing machine. 4,637,230, Cl. 68-4.000.

Robertshaw Controls Company: *See*—
Ochsner, Rolf H., 4,637,131, Cl. 29-622.000.
Shopsky, Harvey J., 4,638,148, Cl. 219-497.000.

Robinson, Anthony, to E.S.G. Controls, Ltd. Boiler cycling controller. 4,637,349, Cl. 122-448.00B.

Robinson, Douglas B.: *See*—
Fry, John A.; and Robinson, Douglas B., 4,637,603, Cl. 272-1.00R.

Rocco, Jean-Claude: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.

Rochte, Randall S. Segmented geometric structure. 4,637,941, Cl. 428-8.000.

Rockett, Leonard R., Jr., to International Business Machines Corporation. Fast writing circuit for a soft error protected storage cell. 4,638,463, Cl. 365-205.000.

Rockwell International Corporation: *See*—
Cummings, Robert J., 4,637,629, Cl. 280-801.000.

Rodime, PLC: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,638,384, Cl. 360-77.000.

Rodin, Gunnar: *See*—
Stridsberg, Lennart; and Rodin, Gunnar, 4,638,232, Cl. 318-640.000.

Rohm GmbH: *See*—
Riemann, Achim; and Ude, Werner, 4,638,099, Cl. 568-638.000.

Rohm and Haas Company: *See*—
Rounds, Nicholas A., 4,637,904, Cl. 264-1.400.

Roland, Michel: *See*—
Hennebert, Pierre; Gillard, Jean; and Roland, Michel, 4,637,916, Cl. 422-36.000.

Rolfe, Jonathan L.: *See*—
Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., 4,638,043, Cl. 528-75.000.

Rolland, Albert L.: *See*—
Le Corre, Loic; and Rolland, Albert L., 4,638,200, Cl. 310-156.000.

Rollhaus, Philip; and Endo, Yukio, to Quixote Corporation. Keyboard entry system. 4,638,306, Cl. 340-365.00R.

Rolls-Royce Limited: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,637,449, Cl. 164-132.000.

Romeu, Ramon. Machining machine. 4,637,107, Cl. 29-27.00C.

Roncucci, Romeo R.: *See*—
Lambelin, Georges E.; Roncucci, Romeo R.; Roba, Joseph; and Gillet, Claude L., 4,638,070, Cl. 549-23.000.

Ronis S.A.: *See*—
Ricouard, Jacques; and Chappoux, Claude, 4,637,507, Cl. 194-212.000.

Roots, Rolland R., to Killark Electric Manufacturing Company. Remote signaling box. 4,638,297, Cl. 340-304.000.

Roozenbeek, Herman: *See*—
Dreyer, Adolf; and Roozenbeek, Herman, 4,637,247, Cl. 73-35.000.

Rosa, John; and Frank, William E., to Westinghouse Electric Corp. High frequency inverter circuit for melting and induction heating. 4,638,138, Cl. 219-10.770.

Rosenbaum, Martin J. Ratchet-action open-end wrench. 4,637,284, Cl. 81-179.000.

Rosenberg, Martin: *See*—
Auerbach, Jeffrey I.; and Rosenberg, Martin, 4,637,980, Cl. 435-68.000.

Rosenberger, Mary E.: *See*—
Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., 4,638,020, Cl. 523-406.000.

Rosenlund, Terje. Method for impregnating wood, and an apparatus for carrying out the method. 4,637,952, Cl. 427-297.000.

Rosenquist, Niles R., to General Electric Company. Compositions. 4,638,101, Cl. 568-720.000.

Rosenquist, Niles R.: *See*—
Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., 4,638,077, Cl. 558-281.000.

Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, to Societe Europeenne de Propulsion. Apparatus for digitalizing an image by analysis by means of a light beam. 4,638,370, Cl. 358-293.000.

Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, to SGS-ATES Componenti Elettronici S.p.A. Integrated structure microcomputer provided with non-volatile RAM memory. 4,638,465, Cl. 365-228.000.

Rossey, Guy: *See*—
Raizon, Bernard; Rossey, Guy; and Wick, Alexander, 4,638,080, Cl. 560-35.000.

Rossnagel, Steven M.: *See*—
Bumble, Bruce; Cuomo, Jerome J.; Logan, Joseph S.; and Rossnagel, Steven M., 4,637,853, Cl. 156-345.000.

Rossow, Harold E.: *See*—
Lane, George A.; and Rossow, Harold E., 4,637,888, Cl. 252-70.000.

Rostek, Paul M.: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.

Rothe, Anselm: *See*—
Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, 4,638,023, Cl. 524-21.000.

Rounds, Nicholas A., to Rohm and Haas Company. Process for molding a polymeric layer onto a substrate. 4,637,904, Cl. 264-1.400.

Rousseau, Jean; and Fourche, Jean P., to Videocolor. Process for positioning and grasping semi ferrites for a magnetic core and centering device for operating said process. 4,637,803, Cl. 445-23.000.

Roussel, Louis J. Anti rotational device for down hole hydraulic pumping unit. 4,637,459, Cl. 166-72.000.

Rowe, Russell L.: *See*—
Bowling, Joseph E.; Carpenter, James H.; and Rowe, Russell L., 4,637,559, Cl. 241-94.000.

Rowson, Stuart C.: *See*—
Hong, Vuong B.; Rowson, Stuart C.; Daniel, Richard A.; and Rostek, Paul M., 4,638,256, Cl. 328-105.000.

Roy, David C. Rotary drive mechanism for energizing toys, kinetic sculptures, or the like. 4,637,152, Cl. 40-495.000.

Roy, Glenn M.: *See*—
Barnett, Ronald E.; Zanno, Paul R.; and Roy, Glenn M., 4,638,071, Cl. 549-88.000.

Rubash, Arlyn R.; and Rubash, Duane R. Holding device. 4,637,632, Cl. 281-45.000.

Rubash, Duane R.: *See*—
Rubash, Arlyn R.; and Rubash, Duane R., 4,637,632, Cl. 281-45.000.

Rubbermaid Commercial Products Inc.: *See*—
Hampshire, James F.; Groth, Hugh F.; and Collins, John M., 4,637,322, Cl. 108-102.000.

Rudelis, Glen H.: *See*—
Rickard, Dale A.; and Rudelis, Glen H., 4,638,183, Cl. 307-291.000.

Ruhle, Wolfgang: *See*—
Glasow, Peter; and Ruhle, Wolfgang, 4,638,165, Cl. 250-370.000.

Ruigrok, Franciscus B. M., to Heras Holding, B.V. Fence pole. 4,637,186, Cl. 52-225.000.

Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., to Borg-Warner Corporation. Combination range and master clutch assembly. 4,637,504, Cl. 192-87.170.

Rumbelow, George: *See*—
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.

Rupprecht, Bernd, to Deutsche Perrot-Bremse GmbH. Expander mechanism for an internal shoe drum brake. 4,637,499, Cl. 188-79.50R.

Rush, James B.; Bryan, James S.; Gunter, Jonas L.; Dillard, Guy W.; Meadows, Roger D.; and Henry, Pearison W., to Dayco Corporation. Branched hose construction, joint construction and part therefor, and methods of making the same. 4,637,638, Cl. 285-158.000.

Rusz, Tibor. Pulmonary ventilator controller. 4,637,385, Cl. 128-204.210.

Ryan, William E.: *See*—
Marino, Dean F.; Ryan, William E.; and Kamp, Arthur J., 4,638,168, Cl. 250-560.000.

Ryder, Francis E.; and Rabenau, Richard, to Ryder International Corporation. Lens disinfecting appliance with improved venting feature. 4,637,919, Cl. 422-300.000.

Ryder International Corporation: *See*—
Ryder, Francis E.; and Rabenau, Richard, 4,637,919, Cl. 422-300.000.

Rynk, Anthony J.; and DeCarlo, David J., to Thomas & Betts Corporation. Method and apparatus for wiring system installation. 4,637,136, Cl. 29-872.000.

Saab-Scania Aktiebolag: *See*—
Gillbrand, Per Sune; and Johansson, Sven H., 4,637,368, Cl. 123-647.000.
Sperr, Gustaf A., 4,637,651, Cl. 297-458.000.

Saari, Veikko R., to AT&T Bell Laboratories. CMOS differential amplifier stage with bulk isolation. 4,638,259, Cl. 330-253.000.

Sacilor: *See*—
Michaux, Jacques M., 4,637,241, Cl. 72-225.000.

Safety-Kleen Corporation: *See*—
Llewellyn, Michael; and Holden, Stephen, 4,637,413, Cl. 134-111.000.

Sagawa, Morikazu; Mori, Yoshikazu; Ohba, Motoi; Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Frequency divider circuits. 4,638,180, Cl. 307-219.100.

Saigo, Takaichi: *See*—
Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, 4,637,781, Cl. 417-216.000.
Saint-Sevin, Michel: *See*—
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, 4,637,692, Cl. 350-486.000.
Saito, Kazuhiko: *See*—
Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, 4,637,238, Cl. 70-456.00R.
Saito, Kenji: *See*—
Yoshimura, Yasuo; Yamauchi, Kunio; and Saito, Kenji, 4,638,366, Cl. 358-228.000.
Saito, Masayuki, to Nitto Seiko Co., Ltd. Retaining structure for screw fastening unit in an articulated robot. 4,637,776, Cl. 414-744.00B.
Saito, Takeshi: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.
Saito, Tokukazu: *See*—
Tanaka, Hirosi; and Saito, Tokukazu, 4,638,162, Cl. 250-327.200.
Saito, Tsutomu; Hasegawa, Yoshimichi; Yoshikawa, Kazuo; and Aoyama, Shigetsune, to Horikiri Spring Mfg. Co., Ltd.; Aichi Steel Works, Ltd.; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Leaf spring construction. 4,637,594, Cl. 267-47.000.
Saito, Yoshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.
Saito, Yuichi: *See*—
Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, 4,638,205, Cl. 310-312.000.
Saitoh, Hiroyuki: *See*—
Leng, Svay; Saitoh, Hiroyuki; Inui, Toshiharu; Koizumi, Norihiko; Moriguchi, Haruhiko; Omori, Takashi; Kurata, Masami; and Katoh, Yasuo, 4,638,372, Cl. 358-296.000.
Saitoh, Keishi: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.
Sajben, Johannes O.: *See*—
Brockmann, Rolf; Casper, Clemens; Damsky, Walter; Lippert, Axel; and Sajben, Johannes O., 4,637,857, Cl. 159-47.100.
Sakai, Kiyoharu, to Brother Kogyo Kabushiki Kaisha. Wire drive circuit in dot-matrix printer. 4,637,742, Cl. 400-121.000.
Sakai, Shinzo: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, 4,637,278, Cl. 74-866.000.
Sakamaki, Hisashi: *See*—
Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.
Sakamoto, Shigemi: *See*—
Masuda, Eiji; and Sakamoto, Shigemi, 4,638,303, Cl. 340-347.0DA.
Sakane, Toshio; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Light metering and processing system particularly for a video camera. 4,638,367, Cl. 358-228.000.
Sakano, Riichi, to Sanden Corporation. Refrigeration system for both vehicle air conditioner and refrigerator. 4,637,220, Cl. 62-200.000.
Sakashita, Kazuhiro: *See*—
Yonezu, Ryo; and Sakashita, Kazuhiro, 4,638,461, Cl. 365-189.000.
Sakuma, Hisayuki; and Hoshinouchi, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Laser machining apparatus. 4,638,145, Cl. 219-121.0LU.
Sakura, Yasuhiro; Nimura, Hitoshi; and Nakayama, Satoshi, to Tokyo Electric Co., Ltd. Thermal printer. 4,638,332, Cl. 346-76.0PH.
Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, 4,638,376, Cl. 358-342.000.
Sakurai, Takashi, to Nippondenso Co., Ltd. Unauthorized entry detection system. 4,638,294, Cl. 340-63.000.
Sakurai, Yoshimi: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Sakurai, Yoshimi, 4,637,278, Cl. 74-866.000.
Salandanan, Carmelita S.: *See*—
Patel, Arvind D.; and Salandanan, Carmelita S., 4,637,883, Cl. 252-8.515.
Salek, Stanley, to Broadcast Electronics, Inc. Independent channel modulation system for AM stereo. 4,638,504, Cl. 381-16.000.
Salem Furnace Co.: *See*—
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., 4,637,795, Cl. 432-138.000.
Salensky, George A., to Union Carbide Corporation. Carboxylic acid-grafted phenoxy resins. 4,638,038, Cl. 525-533.000.
Salutar, Inc.: *See*—
Quay, Steven C., 4,637,929, Cl. 424-9.000.
Sambuis, Bernard; and Gavory, Daniel, to Vulnax International Limited. Ozone-stabilized rubbery elastomers. 4,638,026, Cl. 524-98.000.
SAMIM Societa Azionaria Minero-Mettallurgica, S.p.A.: *See*—
Cammi, Sergio; D'Este, Arturo; and Pescetelli, Alessandro, 4,637,832, Cl. 75-109.000.
Samson, Robert, to Motorola, Inc. Discrete component mounting assembly. 4,638,406, Cl. 361-403.000.
Sanden Corporation: *See*—
Sakano, Riichi, 4,637,220, Cl. 62-200.000.
Sanders, Bernard, to Raynham Investments Limited. Hairdresser's aid. 4,637,411, Cl. 132-9.000.
Sankei Giken Kogyo Kabushiki Kaisha: *See*—
Fukuda, Masuo, 4,637,491, Cl. 181-265.000.
Sannohashi Seisakusho Company, Limited: *See*—
Imai, Yoshio, 4,637,764, Cl. 411-5.000.
Sano, Morio: *See*—
Masui, Takeshi; and Sano, Morio, 4,637,945, Cl. 428-35.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Odashima, Rou, 4,637,355, Cl. 123-73.0AD.
Taguchi, Michihiro; and Onoue, Akihiro, 4,637,802, Cl. 440-75.000.
Sansing, James E.; and McCarver, Byron M. Process for producing ammonium polyphosphate. 4,637,921, Cl. 423-315.000.
Santel, Hans-Joachim: *See*—
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lursaen, Klaus, 4,638,004, Cl. 514-272.000.
Santostasi, Paul A.: *See*—
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Sanyo Electric Co., Ltd.: *See*—
Hiramatsu, Tatsuo, 4,638,364, Cl. 358-227.000.
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, 4,637,223, Cl. 62-263.000.
Shirai, Yoshinari; and Kuranaga, Tutomu, 4,637,373, Cl. 126-340.000.
Saringer, John H., to Toronto Medical Corporation. Device for imparting continuous passive motion to leg joints. 4,637,379, Cl. 128-25.00R.
Sasa, Hiroyuki, to Olympus Optical Co., Ltd. Cleaning apparatus for endoscope. 4,637,378, Cl. 128-4.000.
Sasaki, Katsuyuki: *See*—
Akiyama, Teruo; Sasaki, Katsuyuki; and Saigo, Takaichi, 4,637,781, Cl. 417-216.000.
Sasaki, Shigekuni: *See*—
Maruno, Tooru; Nakamura, Kouzaburou; and Sasaki, Shigekuni, 4,637,939, Cl. 427-162.000.
Sato, Junichi: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.
Sato, Masayonshi; and Harada, Noritake, to Tokyo Kikai Seusakusho Ltd. Mesh roller for printing press and method of fabrication. 4,637,310, Cl. 101-426.000.
Sato, Nobuo: *See*—
Kaneyasu, Masayoshi; Arima, Hideo; Ito, Mitsuko; Iwanaga, Shoichi; Sato, Nobuo; Noro, Takanobu; Ikagami, Akira; and Isogai, Tokio, 4,638,443, Cl. 364-497.000.
Sato, Toshiaki; Yamauchi, Junnosuke; and Okaya, Takuji, to Kuraray Co., Ltd. Polymer composition comprising a protein and a block copolymer which contains a polyvinyl alcohol polymer unit and an ionic polymer unit. 4,638,024, Cl. 524-22.000.
Saviotti, Vanni: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.
Sawada, Kazuo, to Sumitomo Electric Industries, Ltd. Nickel-titanium-beryllium alloy wire. 4,637,846, Cl. 148-402.000.
Sawaki, Akira: *See*—
Kasahara, Seitaro; Sawaki, Akira; and Kawata, Shun, 4,637,707, Cl. 355-3.00R.
Sawaki, Manabu, to Pioneer Electronic Corporation. DC motor driving circuit for eliminating spurious transition conditions. 4,638,222, Cl. 318-111.000.
Sawamura, Mitsuharu; and Ito, Susumo, to Canon Kabushiki Kaisha. Magnetooptical recording medium with laminated anti-reflection film. 4,637,953, Cl. 428-333.000.
Scandpower, Inc.: *See*—
Jacquot, Jean-Paul; and Guillery, Patrick, 4,637,913, Cl. 376-247.000.
Scharpenberg, Rainer; and Baro, Gunter, to Brown Boveri Reaktor GmbH. Apparatus for inspecting fuel assemblies, particularly for detecting defective fuel rods from complete fuel assemblies of water-cooled nuclear reactors. 4,637,912, Cl. 376-245.000.
Schaudt Maschinenbau GmbH: *See*—
Schemel, Roland, 4,637,144, Cl. 33-550.000.
Scheffel, Gary W.; Medvick, Richard J.; and Steiss, William C., to Nupro Company. Check valve. 4,637,430, Cl. 137-516.290.
Schemel, Roland, to Schaudt Maschinenbau GmbH. Apparatus for monitoring the diameters of crankpins during treatment in grinding machines. 4,637,144, Cl. 33-550.000.
Schievelbein, Vernon H.: *See*—
Hawkins, Jeffrey T.; and Schievelbein, Vernon H., 4,637,466, Cl. 166-272.000.
Schiffelers, Hendrik E. P.: *See*—
Bouwens, Jan M. M.; and Schiffelers, Hendrik E. P., 4,637,598, Cl. 271-3.100.
Schikor, Joachim: *See*—
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, 4,638,404, Cl. 361-388.000.
Schindler, Wayne R., to Chamberlain Manufacturing Corporation. Microprocessor controlled garage door operator. 4,638,433, Cl. 364-400.000.
Schinke, Hans-Joachim: *See*—
Breu, Karl-Jan; and Schinke, Hans-Joachim, 4,638,126, Cl. 379-427.000.
Schlein, Allen P. Surgical saw blade. 4,637,391, Cl. 128-317.000.
Schlemper, Eberhard: *See*—
Auch, Wilfried; and Schlemper, Eberhard, 4,638,266, Cl. 332-7.510.
Schlumberger Technology Corporation: *See*—
Leising, Lawrence J., 4,637,479, Cl. 175-26.000.
Schmerda, Richard F.: *See*—
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., 4,638,226, Cl. 318-345.00R.

Schmid, Eckart; and Wanninger, Ludwig, to Siemens Aktiengesellschaft. Circuit assembly for temperature-dependent cathode current tracking in traveling-wave tubes. 4,638,215, Cl. 315-3.500.
Schmid, Rene; and Krehl, Hermann, to Rieter Machine Works Limited. Winding apparatus for forming laps. 4,637,565, Cl. 242-55.100.
Schmid, Wolfgang, to Porsche Aktiengesellschaft. Multi-cylinder internal-combustion engine control device. 4,637,363, Cl. 123-481.000.
Schmidt, Otomar: *See*—
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., 4,638,452, Cl. 364-900.000.
Schmidt, Robert R.: *See*—
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, 4,638,004, Cl. 514-272.000.
Schmiedel, Manfred: *See*—
Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hans; and Schmiedel, Manfred, 4,638,019, Cl. 522-104.000.
Schmitz, John P., to United States of America, Army. Polyactic-polyglycolic acid copolymer combined with decalcified freeze-dried bone for use as a bone repair material. 4,637,931, Cl. 424-78.000.
Schmolka, Irving R.: *See*—
Niu, Joseph H. Y.; and Schmolka, Irving R., 4,637,822, Cl. 44-51.000.
Schnaibel, Eberhard: *See*—
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,638,228, Cl. 318-569.000.
Schneider, Alfred, to Siegenia-Frank KG. Corner deflection assembly. 4,637,165, Cl. 49-192.000.
Schneider, Erich: *See*—
Junginger, Erich; Schnaibel, Eberhard; and Schneider, Erich, 4,638,228, Cl. 318-569.000.
Schneider, Frederick: *See*—
Maroney, Ralf P.; Fishkind, Gregory A.; and Schneider, Frederick, 4,638,399, Cl. 361-220.000.
Schneider, Horst; Zeeh, Rainer; and Neumann, Hans J., to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Chucking device for interchangeable holding of probe pins in a coordinate-measuring instrument. 4,637,119, Cl. 29-568.000.
Schneider, John M.; Piatt, Michael J.; Brown, Mark E.; and Bowers, Mark C., to Eastman Kodak Company. Ink jet filament length and stimulation amplitude assessment system. 4,638,325, Cl. 346-1.100.
Schneider, Werner. Method and apparatus for opening and closing a taphole in furnaces. 4,637,590, Cl. 266-45.000.
Schoch, Stephen A., to Carrier Corporation. Fiber optic moisture analysis probe. 4,637,729, Cl. 356-410.000.
Schoen, Juergen: *See*—
Kirchner, Albert; Schoen, Juergen; and Happ, Ortwin, 4,638,204, Cl. 310-239.000.
Schorn, Franz: *See*—
Finkbeiner, Werner; and Schorn, Franz, 4,637,552, Cl. 239-428.500.
Schramm, Laurier L., to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited; Gulf Canada Limited; Her Majesty the Queen, in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources; HBOG-Oil Sands Limited Partnership; PanCanadian Petroleum Limited; and Petro-Canada Inc., a part interest. Use of a submersible viscometer in the primary separation step of the hot water process for recovery of bitumen from tar sand. 4,637,417, Cl. 137-4.000.
Schrenk, Hartmut, to Siemens Aktiengesellschaft. Method and apparatus for the non-volatile storage of the count of an electronic counting circuit. 4,638,457, Cl. 365-189.000.
Schroder, Gunter; and Berning, Helmut, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for performing remotely-manipulated maintenance on parts of equipment in a shielded nuclear facility. 4,638.234, Cl. 318-661.000.
Schroeder, Gerhardt P., to BOC Group, Inc., The. Coaxial breathing circuit. 4,637,384, Cl. 128-204.180.
Schultz, Charles R.: *See*—
Tollefson, Scott; Wuertz, Howard A.; and Schultz, Charles R., 4,637,755, Cl. 405-181.000.
Schultz, Ronald E.; Schmidt, Otomar; and Johnston, David A., to Allen-Bradley Company, Inc. Programmable controller with dynamically altered programmable real time interrupt interval. 4,638,452, Cl. 364-900.000.
Schultz, William C., to Flood, William H., a part interest. Thrust enhancing propeller duct assembly for water craft. 4,637,801, Cl. 440-67.000.
Schulz, Rene: *See*—
Teubler, Heinz; and Schulz, Rene, 4,637,782, Cl. 417-300.000.
Schulze, Ernst-Friedrich; Burstell, Helmut; and Hacker, Erwin, to Hoechst Aktiengesellschaft. Plant growth regulators. 4,637,828, Cl. 71-76.000.
Schurter, Rolf; and Pissiotas, Georg, to Ciba-Geigy Corporation. Sulfonylureas. 4,637,829, Cl. 71-90.000.
Schuster, Richard L.: *See*—
Wilson, Jerry F.; and Schuster, Richard L., 4,637,515, Cl. 206-434.000.
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., to John Zink Company. Flare gas burner. 4,637,793, Cl. 431-202.000.
Schwartzman, Joel. Rotation speed control device for a rotary, impulse water sprinkler and a water sprinkler having same. 4,637,549, Cl. 239-230.000.
Schwarz, Johann, to Siemens Aktiengesellschaft. Device for cleaning light waveguide plug connector parts. 4,637,089, Cl. 15-118.000.
Schweickert, Robert K., to Massachusetts Institute of Technology. Methods and apparatus for measuring relative gain and phase of voltage input signals versus voltage output signals. 4,638,248, Cl. 324-76.00R.
Scientific Process & Research, Inc.: *See*—
Klein, Imrich, 4,637,790, Cl. 425-208.000.
Sciuto, George J., to Emerson Electric Co. Filter drier. 4,637,881, Cl. 210-689.000.
SCSS Instruments, Inc.: *See*—
Shulenberger, Arthur M.; and Piatt, John A., 4,637,713, Cl. 355-76.000.
Sea-Land Corporstion: *See*—
Van Iperen, Willem H. P., 4,637,763, Cl. 410-52.000.
Searing, Lawrence G.: *See*—
Damiano, Michael A.; Schmerda, Richard F.; and Searing, Lawrence G., 4,638,226, Cl. 318-345.00R.
Seawell, Jesse Q.: *See*—
Bardo, Charles J.; Seawell, Jesse Q.; Dylewski, Anthony J.; and Clark, John L., Jr., 4,637,903, Cl. 261-24.000.
Secord, Nelson W., to Chrysler Motors Corporation. Cable bundler clip. 4,637,097, Cl. 24-16.0PB.
Seeger Corporation: *See*—
Seeger, John W., Jr.; and Kubiak, John W., 4,637,551, Cl. 239-288.500.
Seeger, John W., Jr.; and Kubiak, John W., to Seeger Corporation. Safety guard for airless spray apparatus. 4,637,551, Cl. 239-288.500.
Segerstrom, Lars H., to IMO AB. Hydraulic screw machine. 4,637,787, Cl. 418-203.000.
Seher Acquisition Corp.: *See*—
Hanula, Richard M., 4,637,518, Cl. 213-64.000.
Sekimura, Masayuki; and Shirouzu, Shunji, to Kabushiki Kaisha Toshiba. Semiconductor flow detector for detecting the flow rate and flowing direction of fluid. 4,637,253, Cl. 73-189.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,638,108, Cl. 136-244.000.
Semler Industries Inc.: *See*—
Semler, Loren H., Jr., 4,637,875, Cl. 210-232.000.
Semler, Loren H., Jr., to Semler Industries Inc. Fluid filtering apparatus and tubular filter therefor. 4,637,875, Cl. 210-232.000.
Senasack, Henry E., Jr.: *See*—
Teske, Duane R.; Senasack, Henry E., Jr.; and Wilkins, Mark, 4,637,272, Cl. 74-424.80R.
Sensor Technologies, Inc.: *See*—
Fiori, David, Jr., 4,637,265, Cl. 73-862.330.
Sergent, Rodney H.; and Thanstrom, Kenneth N., to Great Lakes Chemical Corporation. Process for metal recovery and compositions useful therein. 4,637,865, Cl. 204-111.000.
Sermet, Pierre: *See*—
Delaunay, Marc; Gualandris, Rene ; Geller, Richard; Jacquot, Claude; Ludwig, Paul; Mathonnet, Jean-Marc; Rocco, Jean-Claude; Sermet, Pierre; Zadworny, Francois; and Bourg, Francois, 4,638,216, Cl. 315-111.810.
SGS-ATES Componenti Elettronici S.p.A.: *See*—
Palara, Sergio; and Torazzina, Aldo, 4,638,507, Cl. 381-94.000.
Rosini, Paolo; Finaurini, Roberto; and Gaibotti, Maurizio, 4,638,465, Cl. 365-228.000.
SGS-ATES Componenti Elettronici SpA: *See*—
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, 4,638,122, Cl. 379-124.000.
Shade, Gary F.: *See*—
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.
Shah, Hasmukh G.; and Musgrave, Dwight S., to Owens-Corning Fiberglas Corporation. Road repair membrane. 4,637,946, Cl. 428-63.000.
Shah, Shrenik S.: *See*—
Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.
Shannon, Paul J., to Armstrong World Industries, Inc. Polymeric liquid crystals. 4,637,896, Cl. 252-299.700.
Shannon, Thomas G.: *See*—
Brunelle, Daniel J.; Shannon, Thomas G.; and Rosenquist, Niles R., 4,638,077, Cl. 558-281.000.
Sharp Kabushiki Kaisha: *See*—
Arai, Nobushige, 4,637,374, Cl. 126-417.000.
Inami, Yasuhiko; Watanabe, Masanori; and Hijikigawa, Masaya, 4,638,346, Cl. 357-25.000.
Matsuda, Kumehiko; and Komai, Kensaku, 4,638,435, Cl. 364-405.000.
Oya, Yuichiro, 4,638,136, Cl. 219-10.55C.
Shaw, James E.; and Westerman, John, to Phillips Petroleum Company. Permeability contrast correction. 4,637,467, Cl. 166-295.000.
Shell Oil Company: *See*—
Fried, Herbert E., 4,638,093, Cl. 568-73.000.
Lewis, Robert M.; and Van Santen, Rutger A., 4,637,992, Cl. 502-84.000.
Singleton, David M., 4,638,084, Cl. 560-202.000.
van Erp, Willibrord A.; Nanne, Johannes M.; and Post, Martin F. M., 4,637,993, Cl. 502-242.000.
Shen-Orr, Chaim D.; and Berg, Eitan, to Fiscint, Inc. Contactless position sensor with coreless coil coupling component. 4,638,250, Cl. 324-207.000.
Shenoy, Thirthahalli A.; and Winters, Arthur R., Jr., to Air Products and Chemicals, Inc. Method of reliquefying cryogenic gas boiloff from heat loss in storage or transfer system. 4,637,216, Cl. 62-54.000.
Sherman, Daniel A. Tamper-proof rodent bait station. 4,637,162, Cl. 43-131.000.

Sherman, Michael L; and Golston, Stefan, to Kamyr, Inc. Two stage medium consistency pulp pumping. 4,637,779, Cl. 415-143.000.
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., to SpaceLabs, Inc. Addressing for a multipoint communication system for patient monitoring. 4,638,313, Cl. 340-825.520.
Sherwood, Janice K. Mastectomy brassiere. 4,637,398, Cl. 128-478.000.
Shewmon, Daniel C. Reinforced seam construction. 4,637,330, Cl. 112-417.000.
Shibata, Jiro: *See*—
Ohashi, Ryota; Kawamura, Masahisa; and Shibata, Jiro, 4,637,482, Cl. 180-132.000.
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, to Shikoku Kakooki Co., Ltd. Container forming apparatus for packaging machine. 4,637,200, Cl. 53-551.000.
Shibata, Takanori: *See*—
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, 4,638,438, Cl. 364-449.000.
Shields, William, to Environmental Air Control, Inc. Contamination control work station. 4,637,301, Cl. 98-115.300.
Shiga, Toshihiro: *See*—
Noda, Masaru; and Shiga, Toshihiro, 4,638,352, Cl. 358-44.000.
Shigematsu, Kazuo: *See*—
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, 4,637,976, Cl. 430-523.000.
Shigeta, Kunio; Yamamoto, Yoko; and Takahashi, Jiro, to Konishiroku Photo Industry Co., Ltd. Image forming process for electrophotography. 4,637,973, Cl. 430-122.000.
Shigeta, Masao: *See*—
Takayama, Suguru; and Shigeta, Masao, 4,637,843, Cl. 420-73.000.
Shikoku Kakooki Co., Ltd.: *See*—
Shibata, Masato; Eguchi, Mamoru; and Kondo, Yoshihito, 4,637,200, Cl. 53-551.000.
Shima Idea Center Co., Ltd.: *See*—
Shima, Masahiro, 4,637,227, Cl. 66-75.100.
Shima, Masahiro, 4,637,228, Cl. 66-75.100.
Shima, Masahiro, to Shima Idea Center Co., Ltd. Flat knitting machine having compound needles. 4,637,227, Cl. 66-75.100.
Shima, Masahiro, to Shima Idea Center Co., Ltd. Flat knitting machine having compound needles. 4,637,228, Cl. 66-75.100.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,637,273, Cl. 74-489.000.
Nagano, Masashi, 4,637,809, Cl. 474-80.000.
Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Reproduction apparatus. 4,638,368, Cl. 358-256.000.
Shimomoto, Yasunobu, to Daidotokushuko Kabushikikaisha. Fine grains producing apparatus. 4,638,488, Cl. 373-22.000.
Shimuzu, Yoshiro; and Tada, Yoshio, to Mitsui Toatsu Chemicals, Inc. Magnetic recording medium. 4,637,964, Cl. 428-694.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, 4,637,851, Cl. 156-272.600.
Shindo, Osamu: *See*—
Shirayanagi, Moriyasu; Shindo, Osamu; Aiura, Hirochika; and Hara, Tadao, 4,637,720, Cl. 356-125.000.
Shinoda, Tsutae; and Niinuma, Atsuo, to Fujitsu Limited. Gas discharge panel and method for driving the same. 4,638,218, Cl. 315-169.400.
Shirai, Akira: *See*—
Nakamura, Kazumasa; Kobayashi, Ikuya; Nogami, Takahiro; Shirai, Akira; Nomura, Yoshihisa; and Ohashi, Kaoru, 4,637,487, Cl. 180-197.000.
Shirai, Masaharu, to Fuji Xerox Co., Ltd. Apparatus for generating an image from within a sheet-like member. 4,637,709, Cl. 355-3.00R.
Shirai, Shigeru: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,637,972, Cl. 430-84.000.
Shirai, Yoshinari; and Kuranaga, Tutomu, to Sanyo Electric Co., Ltd. Oven. 4,637,373, Cl. 126-340.000.
Shiraishi, Akira: *See*—
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, 4,637,223, Cl. 62-263.000.
Shirasaki, Yuichi: *See*—
Iwamoto, Yoshinao; Shirasaki, Yuichi; Fujise, Masayuki; and Asakawa, Kenichi, 4,637,686, Cl. 350-96.290.
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Shirouzu, Shunji: *See*—
Sekimura, Masayuki; and Shirouzu, Shunji, 4,637,253, Cl. 73-189.000.
Shnitkin, Harold; and Green, Julius, to United Technologies Corporation. Asymmetric ridge waveguide collinear slot array antenna. 4,638,323, Cl. 343-771.000.
Shoemaker, Roger E. Self-propelled scale testing vehicle. 4,637,481, Cl. 177-50.000.
Shopsky, Harvey J., to Robertshaw Controls Company. Control system and control device for controlling a heating unit and method of making the same. 4,638,148, Cl. 219-497.000.
Shrader, Eric J.: *See*—
Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., 4,637,736, Cl. 374-45.000.
Shreve, David S.: *See*—
Lui, Joseph H.; and Shreve, David S., 4,638,028, Cl. 524-387.000.
Shulenberger, Arthur M.; and Piatt, John A., to SCSS Instruments, Inc. Pellicle mounting apparatus. 4,637,713, Cl. 355-76.000.
Shulik, Larry J.: *See*—
Osman, Robert M.; and Shulik, Larry J., 4,637,918, Cl. 422-148.000.
Shur, Don. Hydraulic righting motorcycle kickstand. 4,637,624, Cl. 280-298.000.
Shur, Michael S.: *See*—
Baier, Steven M.; Cirillo, Nicholas C., Jr.; Hanka, Steven A.; and Shur, Michael S., 4,638,341, Cl. 357-15.000.
Sibille, Soline: *See*—
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.
Sidki, Ahmad M.; and Smith, David S., to Internationale Octrooi Maatschappij "Octropa" B.V. Assay processes and materials therefor. 4,637,985, Cl. 436-518.000.
Sieber, Richard W.: *See*—
Cooperman, Michael; and Sieber, Richard W., 4,638,473, Cl. 370-27.000.
Siegenia-Frank KG: *See*—
Schneider, Alfred, 4,637,165, Cl. 49-192.000.
Siemens Aktiengesellschaft: *See*—
Altendorfer, Alois; Dotzauer, Ewald; and Mueller, Wolfgang, 4,638,123, Cl. 379-229.000.
Althaus, Hans-Ludwig; Klann, Jorg; and Kuny, Wilhelm, 4,638,343, Cl. 357-17.000.
Breu, Karl-Jan; and Schinke, Hans-Joachim, 4,638,126, Cl. 379-427.000.
Buettner, Gerhard, 4,638,125, Cl. 381-68.400.
Dost, Willibald; and Kreutzer, Hans, 4,638,486, Cl. 372-107.000.
Fritz, Harald; and Wurll, Peter, 4,637,263, Cl. 73-862.040.
Glasow, Peter; and Ruhle, Wolfgang, 4,638,165, Cl. 250-370.000.
Grossmann, Kurt; Bliesner, Jurgen; and Schikor, Joachim, 4,638,404, Cl. 361-388.000.
Howing, Jurgen, 4,638,113, Cl. 174-34.000.
Kirchner, Albert; Schoen, Juergen; and Happ, Ortwin, 4,638,204, Cl. 310-239.000.
Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, 4,637,682, Cl. 350-96.150.
Neupauer, Helmut, 4,638,415, Cl. 363-35.000.
Neupauer, Helmut; Kaufhold, Wolfgang; and Wild, Georg, 4,638,416, Cl. 363-35.000.
Schmid, Eckart; and Wanninger, Ludwig, 4,638,215, Cl. 315-3.500.
Schrenk, Hartmut, 4,638,457, Cl. 365-189.000.
Schwarz, Johann, 4,637,089, Cl. 15-118.000.
Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hans; and Schmiedel, Manfred, 4,638,019, Cl. 522-104.000.
von Rauch, Moriz, 4,637,257, Cl. 73-706.000.
Siemens Energy & Automation, Inc.: *See*—
Lott, Donald L., 4,638,285, Cl. 338-21.000.
Siffroi, Lucien: *See*—
Belbel, Elie; Caudron, Robert; Fechant, Louis; Haury, Andre ; Lauraire, Michel; Muniesa, Jacques; and Siffroi, Lucien, 4,638,275, Cl. 335-151.000.
Sigelman, Jesse. Binocular ophthalmoscope. 4,637,699, Cl. 351-205.000.
Sigg, Hans, to Meseltron SA. Apparatus for controlling the advance of a machine tool toward a workpiece. 4,637,169, Cl. 51-165.770.
Siligoni, Marco; Lari, Ferdinando; Saviotti, Vanni; and Comino, Vittorio, to SGS-ATES Componenti Elettronici SpA. Monolithically integratable telephone circuit for generating control signals for displaying telephone charges. 4,638,122, Cl. 379-124.000.
Simmonds Precision: *See*—
Bennett, George D., 4,637,943, Cl. 428-35.000.
Vaiden, John C., 4,637,501, Cl. 192-20.000.
Simmons, Billy R., to Crews, Nancy B., a part interest. Rod holder. 4,637,156, Cl. 43-21.200.
Simonsen, Glenn H.; and Klotz, Clayton J., to Allen-Bradley Company. Terminal block marking surface. 4,637,676, Cl. 339-113.00R.
Simplex Security Systems, Inc.: *See*—
Witkoski, Edward J.; and Lizotte, Edgar G., 4,637,237, Cl. 70-285.000.
Simpson, Jeffrey W.: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.
Simunek, Jaroslav: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.
Singleton, David M., to Shell Oil Company. Process for dimerizing acrylates and methacrylates. 4,638,084, Cl. 560-202.000.
Sinha, Ram R. P.: *See*—
Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., 4,638,177, Cl. 307-83.000.
Sinniger, Joseph O.; and Robbi, Anthony D., to RCA Corporation. Digital timing system. 4,638,498, Cl. 377-39.000.
Sitte, Hellmuth, to C. Reichert Optishe Werke, AG. Device for the cryogenic transfer of specimens. 4,637,226, Cl. 62-514.00R.
Skaggs, Bruce A.: *See*—
Rule, Robert D.; Skaggs, Bruce A.; and King, Gerald E., 4,637,504, Cl. 192-87.170.
SKF GmbH: *See*—
Olschewski, Armin; Bauer, Bernhard; and Zirk, Elisabeth, 4,637,806, Cl. 464-130.000.
SKF GmbH Schweinfurt: *See*—
Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, 4,637,740, Cl. 384-425.000.

SKF Steel Engineering AB: *See*—
Thornblom, Jan; and Astner, Gunnar, 4,638,489, Cl. 373-24.000.
Skilling, John B.: *See*—
Paton, H. Neil; and Skilling, John B., 4,637,320, Cl. 105-406.100.
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, to Miles Laboratories, Inc. Composition and test device for determining the presence of leukocytes containing a zwitterion coupling agent. 4,637,979, Cl. 435-19.000.
Sklarski, Dennis J., to Essex Group, Inc. Neoalkoxy titanate in high density mica laminates. 4,637,852, Cl. 156-307.400.
Skotheim, Terje; and Armand, Michel. Photoelectro-chemical cell for conversion of solar energy to electricity and method of its manufacture. 4,637,969, Cl. 429-111.000.
Slaker, Frank A.: *See*—
Archibald, G. Kent; and Slaker, Frank A., 4,637,817, Cl. 604-81.000.
Slattery, Gordon C., to Brunswick Corporation. Shallow water tilt mechanism for outboard motors. 4,637,800, Cl. 440-55.000.
Slodzian, Georges; Costa De Beauregard, Francois; Daigne, Bernard; and Girard, Francois, to Office National d'Etudes et de Recherche Aerospatiales (ONERA); and Universite de Paris-sud. High clarity mass spectrometer capable of multiple simultaneous detection. 4,638,160, Cl. 250-296.000.
Slusarchyk, William A.; and Koster, William H., to E. R. Squibb & Sons, Inc. [3S(Z)]-2-[[[1-(2-amino-4-thiazolyl)-2-[[2,2-dimethyl-4-oxo-1-(sulfooxy)-3-azetidinyl]amino]-2-oxoethylidene]-amino]oxy] acetic acid and intermediate. 4,638,061, Cl. 540-355.000.
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, to Tukovy Prumysl, Koncern. Activator of peroxo compounds. 4,637,894, Cl. 252-186.400.
Smith, David S.: *See*—
Sidki, Ahmad M.; and Smith, David S., 4,637,985, Cl. 436-518.000.
Smith, Forrest D. Toothpick dispenser. 4,637,512, Cl. 206-103.000.
Smith, Harry D., Jr.; and Verbout, Jerry L., to Halliburton Company. Epithermal neutron porosity measurement. 4,638,161, Cl. 250-269.000.
Smith, Kenneth R., to Bicc-Vero Electronics, Inc. Injector/ejector device for circuit board. 4,638,405, Cl. 361-399.000.
Smith, Robert L. Starter shingle. 4,637,191, Cl. 52-522.000.
Smith, Thomas W.; Ward, Anthony T.; Luca, David J.; and Johnson, Gordon E., to Xerox Corporation. Optical recording member. 4,638,335, Cl. 346-135.100.
SmithKline Beckman Corporation: *See*—
Auerbach, Jeffrey I.; and Rosenberg, Martin, 4,637,980, Cl. 435-68.000.
Smits, Wigle F.; and Spaak, Willem E., to U.S. Philips Corporation. Method of determining voltage and current for a given operating period of an X-ray source. 4,638,500, Cl. 378-109.000.
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., to U.S. Philips Corporation. Manipulator having six degrees of freedom. 4,637,777, Cl. 414-751.000.
Snyder, Larry L., to Harrison Western Corporation. Tunnel boring machine. 4,637,657, Cl. 299-31.000.
So, Eddy; and Moore, William J. M., to Canadian Patents and Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee. Digital-to-analog converter. 4,638,302, Cl. 340-347.0DA.
Sochor, Josef, to Robert Bosch GmbH. Push-pull amplifier and method for operation, particularly recording amplifier for video tape recorders. 4,638,382, Cl. 360-68.000.
Societa' Cavi Pirelli S.p.A.: *See*—
Giorgio, Giancarlo; and Parmigiani, Bruno, 4,638,112, Cl. 174-22.00R.
Societe Anonyme D.B.A.: *See*—
Kervagoret, Gilbert, 4,637,208, Cl. 60-547.100.
Perrin, Alain; and Moinard, Patrice, 4,637,747, Cl. 403-23.000.
Societe Corial, S.A.: *See*—
Feniou, Claude; and Descas, Patrick, 4,638,082, Cl. 560-62.000.
Societe de Paris et du Rhone: *See*—
Mazzorana, Alfred B., 4,637,267, Cl. 74-7.00A.
Societe d'Optique, Precision Electronique et Mecanique-Sopelem: *See*—
Baluteau, Jean-Michel; Saint-Sevin, Michel; and Chabanier, Patrick, 4,637,692, Cl. 350-486.000.
Societe Europeenne de Propulsion: *See*—
Rosier, Jean-Claude; Fouche, Claude; and Maincent, Gabriel, 4,638,370, Cl. 358-293.000.
Societe Francaise d'Organo-Synthese: *See*—
Moroux, Julien, 4,637,868, Cl. 204-157.820.
Societe Nationale des Poudres et Explosifs: *See*—
Perichon, Jacques; Rabemanantsoa, Amelie; Sibille, Soline; and D'Incan, Esther, 4,637,863, Cl. 204-59.00R.
Societe Nationale Industrielle Aerospatiale: *See*—
Perin, Robert; Jourdan, Pierre; and Pauly, Bernard, 4,637,573, Cl. 244-54.000.
Soderberg, Paul B., to Soderberg Research & Development, Inc. Tubing drain valve useful with heavy, sand-bearing oil. 4,637,471, Cl. 166-373.000.
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Soderberg, Paul B., 4,637,471, Cl. 166-373.000.
Sogabe, Akira: *See*—
Kimizuka, Norio; Sogabe, Akira; and Abo, Mituyosi, 4,638,421, Cl. 364-167.000.
Sojka, Bernward: *See*—
Trasch, Heinz-Freidrich; Rothe, Anselm; Sojka, Bernward; Werner, Wolfgang; and Wielinger, Hans, 4,638,023, Cl. 524-21.000.
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., to Salem Furnace Co. Method and apparatus for calcining material containing volatile constituents. 4,637,795, Cl. 432-138.000.
Somar Corporation: *See*—
Nishi, Yoshitsugu; and Daigo, Yukitaka, 4,638,501, Cl. 378-182.000.
Somezawa, Masashi: *See*—
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,637,959, Cl. 428-425.900.
Sonne, Darrell S.; and Beard, William J., to Halliburton Company. Gamma ray measurement of earth formation properties using a position sensitive scintillation detector. 4,638,158, Cl. 250-266.000.
Sonne, Darrell S.; and Nunley, Allen, to Halliburton Company. High resolution scintillation crystal. 4,638,164, Cl. 250-366.000.
Sonobe, Takashi: *See*—
Konno, Yutaka; Kawata, Hiroitsu; Aruga, Masayoshi; Sonobe, Takashi; and Mitomi, Mitsuo, 4,637,930, Cl. 424-28.000.
Sony Corporation: *See*—
Hachimori, Takeshi, 4,638,239, Cl. 323-281.000.
Hara, Masaru, 4,638,388, Cl. 360-18.000.
Motoyama, Tadashi, 4,638,375, Cl. 358-338.000.
Ninomiya, Yoshinobu; Somezawa, Masashi; and Oiyama, Kiyokazu, 4,637,959, Cl. 428-425.900.
Tajima, Shigeru; and Nakabayashi, Toshiya, 4,638,223, Cl. 318-254.000.
Takamatsu, Ryoji, 4,638,386, Cl. 360-96.500.
Takeshita, Kaneyoshi, 4,638,361, Cl. 358-213.000.
Tanaka, Sadaaki; and Ushijima, Hisashi, 4,638,363, Cl. 358-219.000.
Wilkinson, James H.; and Gillard, Clive H., 4,638,380, Cl. 360-22.000.
SOR, Inc.: *See*—
Priest, Wayne A., 4,637,258, Cl. 73-716.000.
Sorenson, Wayne P.: *See*—
Manning, James H.; and Sorenson, Wayne P., 4,637,949, Cl. 428-110.000.
Sorochenko, Oleg A., to Nauchno-Issledovatelsky Institut Obschei i Neotlozhno Khirurgii. Electrosurgical instrument. 4,637,390, Cl. 128-303.140.
Sorochenko, Oleg A., to Kharkovsky Nauchno-Issledovatelsky Institut Obschei i Neotlozhnoi Khirurgii. Bipolar electrocoagulator. 4,637,392, Cl. 128-303.130.
Soucek, Jiri: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.
Southwell, Patricia C. Undergarment for handicapped. 4,637,078, Cl. 2-408.000.
Southwest Research Institute: *See*—
King, James D., 4,638,251, Cl. 324-306.000.
Spaak, Willem E.: *See*—
Smits, Wigle F.; and Spaak, Willem E., 4,638,500, Cl. 378-109.000.
SpaceLabs, Inc.: *See*—
Sherwood, Glen R., Jr.; Moon, James B.; and Moyle, Gordon A., 4,638,313, Cl. 340-825.520.
Spannuth, Robert J.: *See*—
Matovich, Edwin; and Spannuth, Robert J., 4,637,858, Cl. 162-30.100.
Speisebecher, Joachim; and Wooge, Christian, to USM Corporation. Melt dispensers. 4,637,745, Cl. 401-1.000.
Speltz, David J.: *See*—
Ciaramitaro, David A.; Speltz, David J.; and Moore, Jack M., 4,637,848, Cl. 149-21.000.
Speranzin, Claudio: *See*—
Badiali, Roberto; Bertoli, Luciano; and Speranzin, Claudio, 4,637,205, Cl. 57-22.000.
Sperr, Gustaf A., to Saab-Scania Aktiebolag. Seat plate. 4,637,651, Cl. 297-458.000.
Sperry Corporation: *See*—
Birkedahl, Byron F., 4,638,229, Cl. 318-584.000.
Bishop, F. Avery; and Leahy, Ronald S., 4,638,493, Cl. 375-1.000.
Kartchner, Earl M.; Price, Robert; and Van Horn, Gary R., 4,638,494, Cl. 375-2.200.
Martin, Hubert C., Jr.; Hitler, Gene D.; and Parsley, David W., 4,638,417, Cl. 363-41.000.
McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., 4,638,261, Cl. 330-277.000.
Stansberry, Warren W., 4,637,619, Cl. 277-167.500.
Spindelfabrik Sussen, Schurr, Stahlecker: *See*—
Griesinger, Rolf; and Fetzer, Gerhard, 4,637,172, Cl. 51-289.00R.
Spiro Investment A.G.: *See*—
Berglund, Bengt, 4,637,428, Cl. 137-503.000.
Spiro, Jan L., to Telautograph Corporation. Communication system having message repeating terminals. 4,638,298, Cl. 340-827.000.
Spoel, Han: *See*—
McMahon, J. Philip; Spoel, Han; and McGinley, John, 4,637,591, Cl. 266-165.000.
Sprague, Robert A.: *See*—
Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., 4,638,334, Cl. 346-108.000.
Spriggs, Dennis M.; and McGlothen, Jody R., to Dresser Industries, Inc. Apparatus and method of well preparation for chemical treatment of produced fluids. 4,637,469, Cl. 166-310.000.
Sproch, James D.: *See*—
Pechar, Henry W., Jr.; and Sproch, James D., 4,638,459, Cl. 365-104.000.

Square D Company: *See*—
Dvorak, Robert F.; and Netolicky, Charles E., 4,638,133, Cl. 200-302.100.
SRI International: *See*—
Andeen, Gerry B.; Shrader, Eric J.; and Kornbluh, Roy D., 4,637,736, Cl. 374-45.000.
Andeen, Gerry B., 4,637,783, Cl. 417-318.000.
Staite, Eric: *See*—
Reid, Iain K.; Staite, Eric; Richmond, Doug; and Rumbelow, George, 4,637,667, Cl. 312-217.000.
Standard Elektrik Lorenz Aktiengesellschaft: *See*—
Feigel, Josef, 4,638,201, Cl. 310-216.000.
Standard-Knapp, Inc.: *See*—
Raudat, John L.; and Thompson, Timothy H., 4,637,509, Cl. 198-425.000.
Standard Microsystems Corp.: *See*—
Pechar, Henry W., Jr.; and Sproch, James D., 4,638,459, Cl. 365-104.000.
Standard Oil Company: *See*—
Gash, Bruce W., 4,637,465, Cl. 166-261.000.
Glocker, David A.; Miller, John R.; Grimshaw, Scott F.; and Windischmann, Henry, 4,637,869, Cl. 204-192.110.
Li, George S.; Wu, Muyen M.; and De Witt, Elmer J., 4,638,042, Cl. 526-280.000.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., 4,638,072, Cl. 549-234.000.
Standard Telephones & Cables Public Limited Company: *See*—
Darton, Kenneth S., 4,638,480, Cl. 370-112.000.
Staniland, Philip A.: *See*—
Ward, Mary V.; Nield, Eric; and Staniland, Philip A., 4,638,037, Cl. 525-471.000.
Stansberry, Warren W., to Sperry Corporation. Concentric seal rings. 4,637,619, Cl. 277-167.500.
Starting Industry Company Limited: *See*—
Osakabe, Mitsuo, 4,637,360, Cl. 123-185.00A.
State University of New York: *See*—
Irvine, Thomas F., Jr.; and Park, Noh-Aeok, 4,637,250, Cl. 73-57.000.
Steck, Robert F.; and Baartman, John L., III, to International Paper Company. Induction sealing of paperboard. 4,637,199, Cl. 53-451.000.
Stefaniu, Marian: *See*—
Gran, Paul; Feiner, Haim; Ben-Dayan, Nissim; Stefaniu, Marian; and Mar-Chaim, Yechiam, 4,638,453, Cl. 364-900.000.
Stefanov, Michael E.; Sullivan, Brian J.; and Ticknor, Anthony J., to Lockheed Missiles & Space Company, Inc. Self-referencing Mach-Zehnder interferometer. 4,637,725, Cl. 356-354.000.
Steinbach, Richard H.: *See*—
Olsen, Joseph C.; and Steinbach, Richard H., 4,637,288, Cl. 83-375.000.
Steiner, Peter: *See*—
Bertram, Leo; Bukoschek, Romuald L.; and Steiner, Peter, 4,637,283, Cl. 81-3.200.
Steingroever, Dietrich; and Steingroever, Erich. Multipolar magnetizing device provided with cooling means. 4,638,280, Cl. 335-284.000.
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Steingroever, Dietrich; and Steingroever, Erich, 4,638,280, Cl. 335-284.000.
Steiss, William C.: *See*—
Scheffel, Gary W.; Medvick, Richard J.; and Steiss, William C., 4,637,430, Cl. 137-516.290.
Stencel Aero Engineering Corp.: *See*—
Miseyko, George; Peck, Walter R.; and Chase, Ronald G., 4,637,577, Cl. 244-147.000.
Stephenson, Robert G., to James Howden Australia Pty. Limited. Fabric filter shaker assembly. 4,637,826, Cl. 55-304.000.
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hansaler, Gerd; and Lursen, Klaus, to Bayer Aktiengesellschaft. Substituted phenylsulphonylureas. 4,638,004, Cl. 514-272.000.
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., to Rodime, PLC. Head positioning mechanism for rotating disk data storage system. 4,638,384, Cl. 360-77.000.
Stewart, Gene L., to Winfield Corporation. Waste management system. 4,637,545, Cl. 232-43.200.
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., to Raychem Corporation. Annular tube-like driver. 4,637,436, Cl. 138-89.000.
Steyaert, Gordon C.: *See*—
McGuire, Charles F.; Steyaert, Gordon C.; and Fontaine, John M., 4,638,261, Cl. 330-277.000.
Stoecker, Carl H., to Boeing Company, The. Stowage bin latch assembly. 4,637,642, Cl. 292-129.000.
Stoffers, Brian L., to Honeywell Information Systems Inc. Equal nine apparatus for supporting absolute value subtracts on decimal operands of unequal length. 4,638,450, Cl. 364-715.000.
Stoll, Kurt. Solenoid valve. 4,637,433, Cl. 137-625.650.
Stoltz, Richard A.; and Kwon, Young J., to Westinghouse Electric Corp. Process for reduction of zirconium, hafnium or titanium using a zinc or tin seal. 4,637,831, Cl. 75-84.500.
Stone, Richard H., to Leyland Vehicles Limited. Vehicle spring suspension arrangement. 4,637,627, Cl. 280-686.000.
Stridsberg, Lennart; and Rodin, Gunnar, to Mydata Automation AB. Method and apparatus for calibrating a positioning system. 4,638,232, Cl. 318-640.000.
Stritzke, Detlef, to Deutsche Gesellschaft. Device for evacuating, filling and closing final storage containers for radioactive materials. 4,638,134, Cl. 219-9.500.
Stromback, Ture J.: *See*—
Akerlund, Mats P.; and Stromback, Ture J., 4,638,301, Cl. 340-347.0CC.
Stubenbort, Joseph W.: *See*—
Solano, William E.; Docherty, James P.; and Stubenbort, Joseph W., 4,637,795, Cl. 432-138.000.
Studt, William L.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,638,001, Cl. 514-212.000.
Stumpe, Leroy, to Du-Al Manufacturing Company. Loader mount. 4,637,772, Cl. 414-686.000.
Stunkard, Gerald A. In-line repairable top entry ball valve. 4,637,421, Cl. 137-327.000.
Suchowerskyj, Wadym: *See*—
Mattes, Bernhard; Oswald, Klaus; and Suchowerskyj, Wadym, 4,638,179, Cl. 307-10.0SB.
Sugaya, Kiyoshi: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, to Takeda Chemical Industries, Ltd. Condensed seven-membered ring compounds, their production and use. 4,638,000, Cl. 514-211.000.
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, to House Food Industrial Company Ltd. Low pressure microwave drying apparatus. 4,637,145, Cl. 34-1.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, to Victor Company of Japan, Ltd. Rotary recording medium which is playable in still picture, slow-motion and normal reproduction modes. 4,638,376, Cl. 358-342.000.
Sugiyama, Kiyoshi; and Furuhashi, Tomio, to Toshiba Kikai Kabushiki Kaisha. Machine tool for drilling printed circuit boards. 4,637,118, Cl. 29-563.000.
Sugiyama, Yoshiyuki; Aoki, Shinichiro; and Morita, Yasuyuki, to Matsushita Electric Industrial Co., Ltd. Ultrasonic probe having dual-motion transducer. 4,637,256, Cl. 73-633.000.
Sullivan, Brian J.: *See*—
Stefanov, Michael E.; Sullivan, Brian J.; and Ticknor, Anthony J., 4,637,725, Cl. 356-354.000.
Sulzer Brothers Limited: *See*—
Aguet, Emile, 4,637,212, Cl. 60-655.000.
Greger, Wolfgang, 4,637,437, Cl. 139-336.000.
Sumida, Nobuyuki: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.
Sumitomo Electric Industries, Ltd.: *See*—
Kohno, Teruhisa, 4,637,661, Cl. 303-24.00A.
Mori, Akinori, 4,638,114, Cl. 174-36.000.
Sawada, Kazuo, 4,637,846, Cl. 148-402.000.
Takada, Hisashi, 4,638,152, Cl. 250-214.00A.
Sumitomo Heavy Industries, Ltd.: *See*—
Kawakami, Takashi, 4,637,452, Cl. 164-420.000.
Sumitomo Metal Industries, Ltd.: *See*—
Maehara, Yasuhiro, 4,637,841, Cl. 148-12.00E.
Sun Coast Plastics, Inc.: *See*—
Dutt, Herbert V.; and Santostasi, Paul A., 4,637,519, Cl. 215-232.000.
Sundeen, Joseph E.; Koster, William H.; and Zahler, Robert, to E. R. Squibb & Sons, Inc. O-sulfated spiro β-lactam hydroxamic acids. 4,638,060, Cl. 540-203.000.
Sundstrand Corporation: *See*—
Niggemann, Richard E., 4,637,456, Cl. 165-104.330.
Symington, John, 4,637,215, Cl. 60-688.000.
Teske, Duane R.; Senasack, Henry E., Jr.; and Wilkins, Mark, 4,637,272, Cl. 74-424.80R.
Support Systems International, Inc.: *See*—
Goodwin, Vernon L., 4,637,083, Cl. 5-453.000.
Sustmann, Scarlet: *See*—
Marini, Ingo G.; and Sustmann, Scarlet, 4,637,820, Cl. 8-129.000.
Sutera, Richard; Dressler, John L.; and Halliday, Bruce W., to Burlington Industries, Inc. Apparatus to damp turbulence in an ink jet fluid supply chamber. 4,638,327, Cl. 346-75.000.
Sutherland, Ian W., to National Research Development Corp. Gelforming polysaccharides. 4,638,059, Cl. 536-121.000.
Sutton, Stephen J., to General Motors Corporation. Apparatus for detecting water in fuel. 4,638,305, Cl. 340-620.000.
Suwa, Kaname, to Canon Kabushiki Kaisha. Keyboard of an electronic apparatus. 4,638,151, Cl. 235-145.00R.
Suwa, Teruko. Fur-skin strip material and method for producing the same. 4,637,206, Cl. 57-31.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Wataru, 4,637,210, Cl. 60-602.000.
Suzuki, Kazunori; Katsuta, Hiroo; and Toriumi, Yuki, to Canon Kabushiki Kaisha. Press apparatus for planar members. 4,637,850, Cl. 156-60.000.
Suzuki, Kisaku. Method of making maki-zushi and an apparatus for making maki-zushi. 4,637,304, Cl. 99-450.200.
Suzuki, Kiyoaki: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.
Suzuki, Norio: *See*—
Okuyama, Kousuke; Suzuki, Norio; Meguro, Satoshi; and Nagasawa, Kouichi, 4,637,124, Cl. 29-571.000.

Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,638,393, Cl. 360-132.000.

Suzuki, Sadahide: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,637,354, Cl. 123-55.0VF.

Suzuki, Takasi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, 4,638,304, Cl. 340-500.000.

Svensson, Klas G.: *See*—
Lobell, Hans; Svensson, Klas G.; Gladh, Goran; and Hoglander, Bjorn, 4,637,213, Cl. 60-685.000.

Svensson, Leif; Nyqvist, Jan-Olof; and Westling, Lars, to Aktiebolaget Bofors. Crystallization method for HMX and RDX. 4,638,065, Cl. 544-196.000.

Svensson, Torsten, to Ternofrost Sweden AB. Door. 4,637,167, Cl. 49-386.000.

Swadell, Robert A. Self-equalizing lifting trailer. 4,637,770, Cl. 414-495.000.

Swagelok Company: *See*—
Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., 4,637,432, Cl. 137-614.030.

Swanson, Edward A.: *See*—
Reed, Charles C.; Cooley, Denton A.; Crane, Terry N.; Swanson, Edward A.; Oscarsson, Rolf A.; Liebmann, Vern L.; and Cox, Dan L., 4,637,917, Cl. 422-46.000.

Swartout, Willson C. Patient position monitoring system. 4,638,307, Cl. 340-666.000.

Sweet Victory, Inc.: *See*—
Levine, Morris M., 4,637,221, Cl. 62-342.000.

Sweetin, Willard L. Apparatus and methods for engaging toothpicks to assemble a toy structure. 4,637,805, Cl. 446-71.000.

Swinkels, Wouter H.: *See*—
Smulders, Hendricus F. G.; Franken, Adrianus J. J.; Faber, Johannes W.; and Swinkels, Wouter H., 4,637,777, Cl. 414-751.000.

Swisher, George W., Jr., to CMI Corporation. Road planar having particle reducing means. 4,637,753, Cl. 404-90.000.

Swisher, Steven L., to Brunswick Corporation. Feathering ring for fishing reels. 4,637,569, Cl. 242-84.20A.

Swiss Aluminium Ltd.: *See*—
Weingartner, Fritz, 4,637,908, Cl. 264-143.000.

Switall, Thomas G., to Rayco Graphic Manufacturing, Inc. Apparatus for applying silicone emulsion to a paper web. 4,637,341, Cl. 118-694.000.

Sykes, Christopher G.: *See*—
Bryant, Michael J.; Attenborough, Frank R.; Sykes, Christopher G.; and Cameron, Neil W., 4,638,469, Cl. 367-154.000.

Symington, John, to Sundstrand Corporation. Regenerator with spray cooler. 4,637,215, Cl. 60-688.000.

Synthelabo: *See*—
Raizon, Bernard; Rossey, Guy; and Wick, Alexander, 4,638,080, Cl. 560-35.000.

Szabolcsi, Tamas: *See*—
Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, 4,638,002, Cl. 514-212.000.

Szalvay, Laszlo: *See*—
Stewart, John B., Jr.; Szalvay, Laszlo; de Brunier, Bernard; and Simpson, Jeffrey W., 4,637,436, Cl. 138-89.000.

Szekely, Istvan; Botar, Sandor; Dolgos nee Kekesi, Krisztina; Bertok, Bela; Gajary, Antal; Szabolcsi, Tamas; Kovacs, Gabor; and Lovasz nee Gaspar, Marianna, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 2,3,4-trinor-1,5-inter-meta-phenylene-prostacyclin compounds useful in inhibiting thrombocyte aggregation. 4,638,002, Cl. 514-212.000.

Szelke, Michael; and Jones, David M., to Aktiebolaget Hassle. Enzyme inhibition. 4,638,047, Cl. 530-332.000.

Szendrodi, Valer: *See*—
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, 4,637,315, Cl. 104-135.000.

Szostak, Rosemarie, to Mobil Oil Corporation. Synthetic crystalline silicate. 4,637,923, Cl. 423-328.000.

Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., to Thermedics, Inc. Drug release system. 4,638,043, Cl. 528-75.000.

T. A. Pelsue Company: *See*—
Beavers, Allan E., 4,637,748, Cl. 403-170.000.

Tachikawa Spring Co., Ltd.: *See*—
Inoue, Nobuhiro, 4,637,650, Cl. 297-410.000.

Tada, Takashi: *See*—
Miyazaki, Kenji; Hagio, Tsuyoshi; Ogawa, Ichitaro; Yoshida, Hisayoshi; Kobayashi, Kazuo; Kashima, Kazutsugu; Tada, Takashi; Hayashi, Yoichiro; and Abe, Wataru, 4,637,884, Cl. 252-12.000.

Tada, Yoshio: *See*—
Shimuzu, Yoshiro; and Tada, Yoshio, 4,637,964, Cl. 428-694.000.

Taga, Kazumitsu: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Taga, Kazumitsu; and Hattori, Ryuichi, 4,637,145, Cl. 34-1.000.

Taguchi, Michihiro; and Onoue, Akihiro, to Sanshin Kogyo Kabushiki Ksisha. Twin outboard drive for watercraft. 4,637,802, Cl. 440-75.000.

Taheri, Syde A. Protective garment. 4,637,074, Cl. 2-2.000.

Taiyo Fishery Co. Ltd.: *See*—
Matsubayashi, Kaneo, 4,637,094, Cl. 17-1.00G.

Tajima, Hatsuo: *See*—
Hosoi, Atsushi; Kan, Fumitaka; Egami, Hidemi; Tajima, Hatsuo; Nakamura, Shunji; and Nakahata, Kimio, 4,637,706, Cl. 355-3.0DD.

Tajima, Kyousuke, to Hosiden Electronics Co., Ltd. Connector socket. 4,637,669, Cl. 339-14.00R.

Tajima, Shigeru; and Nakabayashi, Toshiya, to Sony Corporation. Motor driving circuit. 4,638,223, Cl. 318-254.000.

Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., to Westinghouse Electric Corp. Rotating flux transformer. 4,638,177, Cl. 307-83.000.

Takada, Hisashi, to Sumitomo Electric Industries, Ltd. Photoelectric converting circuit having a low parasitic capacitance. 4,638,152, Cl. 250-214.00A.

Takada, Mitsuru: *See*—
Itoh, Hiroshi; and Takada, Mitsuru, 4,637,279, Cl. 74-866.000.

Takagi, Toshinori: *See*—
Okubo, Masao; Sugaya, Kiyoshi; Takagi, Toshinori; and Ishikawa, Junzo, 4,638,217, Cl. 315-111.810.

Takahashi, Jiro: *See*—
Shigeta, Kunio; Yamamoto, Yoko; and Takahashi, Jiro, 4,637,973, Cl. 430-122.000.

Takahashi, Shigeyuki; Uchida, Manabu; and Yamazaki, Kazuhiro, to Daicel Chemical Industries, Ltd. Cellulose acetate molding containing odoriferous substance. 4,638,057, Cl. 536-76.000.

Takahashi, Tadashi: *See*—
Morinaga, Shigeki; Miyashita, Kunio; Hayashida, Hiroshi; and Takahashi, Tadashi, 4,638,225, Cl. 318-341.000.

Takahashi, Tsuneo; and Otsuka, Hirofumi, to Honda Giken Kogyo Kabushiki Kaisha. Optical torque detector. 4,637,264, Cl. 73-862.330.

Takahashi, Tsutomu: *See*—
Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, 4,637,134, Cl. 29-741.000.

Takamatsu, Ryoji, to Sony Corporation. Operation changing mechanism responsive to direction change of a reversible motor. 4,638,386, Cl. 360-96.500.

Takashima, Toshiharu: *See*—
Murata, Kazushi; Takashima, Toshiharu; and Nakashima, Kunimichi, 4,637,108, Cl. 29-33.00P.

Takata, Hiroshi: *See*—
Yanagiuchi, Noboru; Adachi, Shigeo; Inoue, Masatoshi; Takata, Hiroshi; and Matsuda, Toyoshi, 4,637,270, Cl. 74-336.500.

Takata, Nobuharu: *See*—
Hirosaki, Yoshihiko; and Takata, Nobuharu, 4,637,296, Cl. 98-1.000.

Takayama, Nobutoshi: *See*—
Kozuki, Susumu; Nagasawa, Kenichi; Edakubo, Hiroo; Sato, Junichi; and Takayama, Nobutoshi, 4,638,390, Cl. 360-74.100.

Takayama, Suguru; and Shigeta, Masao, to TDK Corporation. Core of a noise filter comprised of an amorphous alloy. 4,637,843, Cl. 420-73.000.

Takayama, Tsutomu: *See*—
Kato, Tokuzo; Takayama, Tsutomu; and Kaji, Toshio, 4,638,350, Cl. 358-29.000.

Takeda Chemical Industries, Ltd.: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,638,000, Cl. 514-211.000.

Takeda, Hideto, to Nippondenso Co., Ltd. Electromagnetic fuel injector with magnetic stop member. 4,637,554, Cl. 239-585.000.

Takeda, Yoshiro: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.

Takehara, Shin, to Nissan Motor Co., Ltd. Power unit mount assembly. 4,637,584, Cl. 248-559.000.

Takei, Yoshiaki; Nomori, Hiroyuki; and Matuura, Katumi, to Konishiroku Photo Industry Co., Ltd. Photoreceptor having polycarbonate layers and process for the preparation thereof. 4,637,971, Cl. 430-59.000.

Takeo, Yasuhiro: *See*—
Nakayama, Toshihiko; Moriguchi, Fujio; Murayama, Tomio; and Takeo, Yasuhiro, 4,638,329, Cl. 346-76.0PH.

Takeshita, Kaneyoshi, to Sony Corporation. Solid state image pickup. 4,638,361, Cl. 358-213.000.

Takeuchi, Tadashi: *See*—
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.

Takeuchi, Yasuhito, to Yokogawa Medical Systems, Limited. Azimuth adaptive phased array sonar. 4,638,467, Cl. 367-105.000.

Takezaki, Jiro: *See*—
Endo, Akira; Takezaki, Jiro; Tsujii, Fumio; and Shibata, Takanori, 4,638,438, Cl. 364-449.000.

Tamaki, Hiroaki; and Nakamura, Joji, to Kabushiki Kaisha Komatsu Seisakusho. Method of driving hollow piles into the ground. 4,637,758, Cl. 405-248.000.

Tamamushi, Masahiro: *See*—
Asakuno, Hiroyoshi; Mori, Kinya; Suzuki, Kiyoaki; Nishida, Mamoru; Iwai, Kenji; Tamamushi, Masahiro; and Kawasaki, Teruo, 4,638,030, Cl. 524-536.000.

Tamano, Yutaka: *See*—
Arai, Shoji; Tamano, Yutaka; and Hasegawa, Masazumi, 4,638,016, Cl. 521-129.000.

Tan, Khen-Sang: *See*—
Hester, Richard K.; and Tan, Khen-Sang, 4,638,451, Cl. 364-900.000.

Tanaka, Hiroaki; and Akita, Shigeyuki, to Nippon Soken, Inc. Incremental encoder rotational position detector. 4,638,249, Cl. 324-166.000.
Tanaka, Hirosi; and Saito, Tokukazu, to Fuji Photo Film Co., Ltd. Method of adjusting radiation image read-out condition. 4,638,162, Cl. 250-327.200.
Tanaka, Keiji; Honryo, Hatsuo; and Koga, Takeri, to Fuji Photo Film Co., Ltd. Device for continuously cutting and winding a web. 4,637,567, Cl. 242-56.00R.
Tanaka, Kouzou: *See*—
Yoshida, Takeshi; Honda, Takayasu; Kitazume, Shunosuke; and Tanaka, Kouzou, 4,637,653, Cl. 297-334.000.
Tanaka, Sadaaki; and Ushijima, Hisashi, to Sony Corporation. Automatic beam current control system for television camera. 4,638,363, Cl. 358-219.000.
Tanaka, Seiichi: *See*—
Kimura, Tetsuo; Tanaka, Seiichi; and Suzuki, Takasi, 4,638,304, Cl. 340-500.000.
Tanaka, Takao: *See*—
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, 4,637,767, Cl. 411-411.000.
Tanaka, Takashi; and Yamamoto, Satoru, to Yoshida Kogyo K. K. Beam for a dyeing apparatus. 4,637,233, Cl. 68-198.000.
Tanaka, Teruaki: *See*—
Arii, Kazuhiro; Tanaka, Teruaki; Sumida, Nobuyuki; and Arisaka, Kouhei, 4,637,563, Cl. 242-4.00B.
Tanaka, Toyoji: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,637,711, Cl. 355-72.000.
Tanaka, Yoshiro: *See*—
Owa, Yutaka; Tanaka, Yoshiro; Saito, Takeshi; and Takeda, Yoshiro, 4,637,759, Cl. 405-270.000.
Tandem Computers Incorporated: *See*—
Pauker, Armando; and Preuit, Richard B., 4,638,240, Cl. 323-289.000.
Tani, Nobutaka; and Hayashi, Tsuneo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Adsorbent and process for preparing the same. 4,637,994, Cl. 502-404.000.
Tani, Yoshiki: *See*—
Yamada, Hideaki; and Tani, Yoshiki, 4,637,982, Cl. 435-129.000.
Tanner, Paul W. Window protection. 4,637,444, Cl. 160-91.000.
Tanno, Kohetsu: *See*—
Kurogi, Yukinori; Endo, Nobuhiro; and Tanno, Kohetsu, 4,637,127, Cl. 29-576.00E.
Tanny, Michael W., to Unit Industries, Inc. Circuit board soldering device. 4,637,541, Cl. 228-180.100.
Tanton, George A.: *See*—
Walker, Clifford G.; and Tanton, George A., 4,637,726, Cl. 356-367.000.
Taplin, John F. Supply control valve with integral pressure limiter. 4,637,431, Cl. 137-596.150.
Tari, Istvan: *See*—
Nagy, Jeno; Szendrodi, Valer; and Tari, Istvan, 4,637,315, Cl. 104-135.000.
Tarlow, Kenneth. Combination spotlight and table lamp. 4,638,413, Cl. 362-242.000.
Tartt, Evangeline; and Webber, Sandra. Convertible vest-bag. 4,637,076, Cl. 2-102.000.
Tateno, Kenichi: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,637,130, Cl. 29-588.000.
Tateno, Shigeru: *See*—
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, 4,637,851, Cl. 156-272.600.
Tatsumi, Hiroshi, to Kubota, Ltd. Detecting apparatus utilizing light beams. 4,638,157, Cl. 250-236.000.
Taylor, James W., Jr. Pneumatic thread tensioning device. 4,637,229, Cl. 66-146.000.
Tazoh, Yasuo: *See*—
Kobayashi, Kensuke; and Tazoh, Yasuo, 4,638,185, Cl. 307-352.000.
Tchernev, Dimiter I. Heat pump energized by low-grade heat source. 4,637,218, Cl. 62-106.000.
TDK Corporation: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Saito, Yoshiaki; and Kubota, Yuichi, 4,637,963, Cl. 428-694.000.
Takayama, Suguru; and Shigeta, Masao, 4,637,843, Cl. 420-73.000.
TDK Electronics Co., Ltd.: *See*—
Fujita, Hideo; Saito, Yuichi; and Miura, Masatoshi, 4,638,205, Cl. 310-312.000.
Tecla Company, Inc.: *See*—
Clark, Richard N., 4,637,081, Cl. 5-18.00R.
Tecsyn Canada Limited: *See*—
Tomarin, Seymour A., 4,637,942, Cl. 428-17.000.
Teder, Leonid O.; Org. Tiit A.; Lauri, Vaino G.; and Aas, Ants J., to Proizvodstvennoe Obiedinenie "Norma". Safety belt buckle for vehicles. 4,637,102, Cl. 24-642.000.
Teijin Limited: *See*—
Masuho, Yasuhiko; Hara, Takeshi; and Noguchi, Teruhisa, 4,638,049, Cl. 530-388.000.
Tektronix, Inc.: *See*—
Penney, Bruce J., 4,638,255, Cl. 328-36.000.
Telautograph Corporation: *See*—
Spiro, Jan L., 4,638,298, Cl. 340-827.000.
Telles, Norman C. Plotting device. 4,637,143, Cl. 33-457.000.
Temple, Chester S.: *See*—
Das, Balbhadra; Temple, Chester S.; and Melle, Carl A., 4,637,956, Cl. 428-391.000.
Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, to Asahi Denka Kogyo Kabushiki Kaisha. Process for making creamy bacteria-free foamable oil-in-water emulsion including chocolate. 4,637,937, Cl. 426-570.000.
Terao, Motoyasu; Miyauchi, Yasushi; Shigematsu, Kazuo; and Horigome, Shinkichi, to Hitachi, Ltd. Information recording member. 4,637,976, Cl. 430-523.000.
Terashima, Kazutaka: *See*—
Fukuda, Tsuguo; and Terashima, Kazutaka, 4,637,854, Cl. 156-607.000.
Terman, Lewis M.: *See*—
Rajeevakumar, Thekkemadathil V.; and Terman, Lewis M., 4,638,462, Cl. 365-203.000.
Termofrost Sweden AB: *See*—
Svensson, Torsten, 4,637,167, Cl. 49-386.000.
Terra Tek, Inc.: *See*—
Owen, Lawrence B.; Masterson, Daniel M.; and Green, Sidney J., 4,637,217, Cl. 62-74.000.
Terrill, Larry R.: *See*—
Carr, Francis L.; and Terrill, Larry R., 4,638,236, Cl. 320-21.000.
Teshima, Tsunehiko, to Hitachi, Ltd. Tracking control system for a video tape recorder. 4,638,379, Cl. 360-19.100.
Teske, Duane R.; Senasack, Henry E., Jr.; and Wilkins, Mark, to Sundstrand Corporation. Ballscrew actuator. 4,637,272, Cl. 74-424.80R.
Tetenbaum, Marvin T.: *See*—
Christenson, Roger M.; Rosenberger, Mary E.; and Tetenbaum, Marvin T., 4,638,020, Cl. 523-406.000.
Tetzlaff, Wolfgang: *See*—
Braunlich, Peter F.; and Tetzlaff, Wolfgang, 4,638,163, Cl. 250-337.000.
Teubler, Heinz; and Schulz, Rene, to Vickers Systems GmbH. Rotary vane pump. 4,637,782, Cl. 417-300.000.
Texaco Inc.: *See*—
Bhattacharya, Ajit K., 4,638,076, Cl. 558-277.000.
Dach, Michael M., 4,637,823, Cl. 48-77.000.
Hawkins, Jeffrey T.; and Schievelbein, Vernon H., 4,637,466, Cl. 166-272.000.
Hight, Margaret A., 4,637,461, Cl. 166-245.000.
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Hester, Richard K.; and Tan, Khen-Sang, 4,638,451, Cl. 364-900.000.
McAdams, Hugh P., 4,638,182, Cl. 307-270.000.
Ott, Granville E., 4,638,309, Cl. 340-752.000.
Witter, David E.; and Levine, Jules D., 4,637,855, Cl. 156-616.00R.
Textron Inc.: *See*—
Benson, Terrance G.; and Lewis, Dean M., 4,637,204, Cl. 56-249.000.
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Theiling, Louis F., Jr.: *See*—
Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., 4,638,029, Cl. 524-430.000.
Thermedics, Inc.: *See*—
Szycher, Michael; Dempsey, Donald J.; and Rolfe, Jonathan L., 4,638,043, Cl. 528-75.000.
Thomann, Christof, to Zellweger Uster, Ltd. Measuring device for measuring the cross-section of textile yarns. 4,638,169, Cl. 250-560.000.
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Rynk, Anthony J.; and DeCarlo, David J., 4,637,136, Cl. 29-872.000.
Thomas, Glenn R.; and McKee, Jere L., to Westinghouse Electric Corp. Circuit breaker with blow open latch. 4,638,277, Cl. 335-190.000.
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Doherty, James B.; Finke, Paul E.; Firestone, Raymond A.; Shah, Shrenik S.; and Thompson, Kevan R., 4,637,999, Cl. 514-201.000.
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Krull, Ulrich J.; and Thompson, Michael, 4,637,861, Cl. 204-1.00T.
Thompson, Michael D.; and Imes, Clifford W., IV, to Xerox Corporation. Developer metering structure. 4,637,340, Cl. 118-657.000.
Thompson, Richard E.; and Uzzel, Robert G., to Lucas Industries. Self adjusting actuator for vehicle brakes. 4,637,498, Cl. 188-71.900.
Thompson, Robert A.; and White, Robert S., to General Electric Company. Adaptive displacement sensor for contour machining. 4,637,248, Cl. 73-37.500.
Thompson, Timothy H.: *See*—
Raudat, John L.; and Thompson, Timothy H., 4,637,509, Cl. 198-425.000.
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Thornblom, Jan; and Astner, Gunnar, to SKF Steel Engineering AB. Method and means for use in the installation of plasma generators in shaft furnaces. 4,638,489, Cl. 373-24.000.
Thorndike, Charles E. Log carrier. 4,637,769, Cl. 414-454.000.

Thornton, Robert L.: *See*—
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Three Bond Co., Ltd.: *See*—
McGinniss, Vincent D., 4,638,035, Cl. 525-384.000.
Thurnau, Edwin H.: *See*—
McQueen, Coy E.; Twedt, Lynn O.; and Thurnau, Edwin H., 4,637,446, Cl. 160-207.000.
Thurow, Horst, to Hoechst Aktiengesellschaft. Aqueous protein solutions which are stable towards denaturing, processes for their preparation and their use. 4,637,834, Cl. 106-124.000.
Tibussek, Fritz, to Wirth Maschinen- und Bohrgerate-Fabrik GmbH. Tool member for a rotary drilling tool. 4,637,659, Cl. 299-89.000.
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Stefanov, Michael E.; Sullivan, Brian J.; and Ticknor, Anthony J., 4,637,725, Cl. 356-354.000.
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Tokheim Corporation: *See*—
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Tokico Ltd.: *See*—
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Tokyo Electric Co., Ltd.: *See*—
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Tokyo Kikai Seusakusho Ltd.: *See*—
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Tokyo Sanyo Electric Co., Ltd.: *See*—
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Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
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Tollefson, Scott; Wuertz, Howard A.; and Schultz, Charles R. Apparatus for burying conduit. 4,637,755, Cl. 405-181.000.
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Tomita, Tomoya; Hiramoto, Sotozi; Okubo, Takesi; Matsuo, Kuniyuki; Ashihara, Hiromoto; Nakamura, Mitsuo; Takahashi, Tsutomu; Fujino, Motoaki; and Hosaka, Kenji, to Hitachi, Ltd. Apparatus for automatically inserting electronic part. 4,637,134, Cl. 29-741.000.
Tomita, Yasuo; Ogura, Shigetaro; and Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Method of making an optical coupler device utilizing volatile liquid to achieve optical contact. 4,637,684, Cl. 350-96.190.
Tomizawa, Fumio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Shroud for arc furnace. 4,638,487, Cl. 373-9.000.
Tomlinson, James E., to Anderson Strathclyde PLC. Line pans. 4,637,510, Cl. 198-735.000.
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Topura Co., Ltd.: *See*—
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, 4,637,767, Cl. 411-411.000.
Toray Industries, Inc.: *See*—
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Lamusga, Gary R., 4,637,202, Cl. 56-16.600.
Torobin, Leonard B. Hollow porous microspheres as substrates and containers for catalysts and method of making same. 4,637,990, Cl. 502-10.000.
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TOTAL Compagnie Francaise des Petroles: *See*—
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Toya Soda Manufacturing Co., Ltd.: *See*—
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Toyo Soda Manufacturing Co., Ltd.: *See*—
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Toyoda Koki Kabushiki Kaisha: *See*—
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Troy, Leonard. Improved continuous low fluid exchange water heater. 4,637,347, Cl. 122-20.00A.
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Turcott, James L.; and Matheny, Rodney C. Anchor bolt installation tool with depth stop. 4,637,539, Cl. 227-156.000.
Turner, Loren J. Apparatus for underground insect and animal extermination. 4,637,161, Cl. 43-130.000.
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Uba, Toshio; and Nelson, Robert F., to Gates Energy Products, Inc. Sealed lead-acid cell. 4,637,966, Cl. 429-57.000.
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Uda, Youichi; Matsushima, Seiya; Saito, Kazuhiko; Yamamoto, Shoji; and Murakami, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha; and Honda Lock Manufacturing Co., Ltd. Folding key for vehicles. 4,637,238, Cl. 70-456.00R.
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Ueda, Atsushi: *See*—
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Ueno, Moriaki, to Alps Electric Co., Ltd. Voltage controlled oscillator with series connected resonance element and switched capacitance. 4,638,264, Cl. 331-117.00D.
Ueno, Susumu; Kuroda, Kouiti; Nomura, Hirokazu; and Tateno, Shigeru, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a laminate. 4,637,851, Cl. 156-272.600.
Uhri, Duane C., to Mobil Oil Corporation. Method of determining and displaying the orientation of subsurface formations. 4,638,254, Cl. 324-323.000.
Ujihara, Hiroshi, to Ohi Seisakusho Co., Ltd. Wire compensator for a wire driving window regulator. 4,637,166, Cl. 49-352.000.
Umebayashi, Kazuyuki; and Yamada, Takahiro, to Aisin Seiki Kabushikikaisha. Vehicle-loaded display device. 4,638,287, Cl. 340-22.000.
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Undin, Hans; and Wiener, Hans, to C. A. Weidmuller GmbH & Co. Locator device for a tool provided with crimping dies for cable shoes. 4,637,242, Cl. 72-410.000.
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Mitchell, Peter W. D., 4,638,103, Cl. 568-827.000.
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Chou, David T.; and Ligon, Robert C., 4,638,088, Cl. 564-23.000.
Meschke, Debra J.; Hoy, Kenneth L.; and Theiling, Louis F., Jr., 4,638,029, Cl. 524-430.000.
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Agriculture: *See*—
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Jones, David I. G., 4,637,259, Cl. 73-794.000.
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Alexis, Roger P. J., 4,638,479, Cl. 370-95.000.
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Le Floch, Gerard, 4,638,349, Cl. 358-23.000.
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Shnitkin, Harold; and Green, Julius, 4,638,323, Cl. 343-771.000.
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UOP Inc.: *See*—
Greenwood, Arthur R., 4,637,266, Cl. 73-863.860.
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Urban, Ted F., to Lamico, Inc. Arm piece assembly for crutch. 4,637,414, Cl. 135-73.000.
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Terada, Kimio; Mori, Michio; Goto, Yoichi; Nakazawa, Takashi; Muto, Kunio; and Usami, Shozo, 4,637,937, Cl. 426-570.000.
Ushida, Kunihiro: *See*—
Tsunooka, Tsutomu; Takeuchi, Tadashi; Ushida, Kunihiro; and Kawajiri, Shogo, 4,638,206, Cl. 310-313.00B.
Ushijima, Hisashi: *See*—
Tanaka, Sadaaki; and Ushijima, Hisashi, 4,638,363, Cl. 358-219.000.
USM Corporation: *See*—
Speisebecher, Joachim; and Wooge, Christian, 4,637,745, Cl. 401-1.000.
Uzzel, Robert G.: *See*—
Thompson, Richard E.; and Uzzel, Robert G., 4,637,498, Cl. 188-71.900.
VA.NI.M S.r.l: *See*—
Piuma, Adolfo, 4,637,920, Cl. 423-67.000.
Vaiden, John C., to Simmonds Precision. Gear motor decoupling device. 4,637,501, Cl. 192-20.000.
Valeo: *See*—
Billet, Rene , 4,637,506, Cl. 192-110.00B.
Valle, Franco; and Museo, Pietro, to Ing. C. Olivetti & C., S.p.A. Actuation device for two typewriter functions. 4,637,744, Cl. 400-185.000.

Valls, Jose E., to Vasallo Research & Development Corporation. Composite gasket and fitting including same. 4,637,618, Cl. 277-152.000.

Valtion Teknillinen Tutkimuskeskus: *See*—
Pellinen, Markku; Malkki, Yrjo ; and Niskanen, Aimo, 4,637,163, Cl. 47-1.100.

Vanderhoof, John R. Method for a game. 4,637,609, Cl. 273-272.000.

van Erp, Willibrord A.; Nanne, Johannes M.; and Post, Martin F. M., to Shell Oil Company. Process for preparation of catalyst. 4,637,993, Cl. 502-242.000.

Van Horn, Gary R.: *See*—
Kartchner, Earl M.; Price, Robert; and Van Horn, Gary R., 4,638,494, Cl. 375-2.200.

Van Iperen, Willem H. P., to Sea-Land Corporation. Hanging multi-deck system for storing and shipping articles in containers. 4,637,763, Cl. 410-52.000.

Van Noy, John H.: *See*—
Frind, Gerhard; Carroll, James J.; Van Noy, John H.; Leach, John G.; and Ranjan, Radha K., 4,638,283, Cl. 337-162.000.

van Rosmalen, Gerard E., to U.S. Philips Corporation. Optical scanning unit comprising a translational-position and angular-position detection system for an electro-magnetically suspended objective. 4,638,471, Cl. 369-46.000.

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Van Santen, Rutger A.: *See*—
Lewis, Robert M.; and Van Santen, Rutger A., 4,637,992, Cl. 502-84.000.

Vanselous, Joseph S., to Ford Motor Company. Control valve system for a four-speed automatic power transmission transaxle. 4,637,281, Cl. 74-869.000.

Varney, Frederick M.: *See*—
Varney, J. Arnold; and Varney, Frederick M., 4,637,376, Cl. 126-451.000.

Varney, J. Arnold; and Varney, Frederick M. High efficiency solar heater. 4,637,376, Cl. 126-451.000.

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Vaughn, Steven T., to General Electric Company. Storage of digitized video images on disk. 4,638,381, Cl. 360-51.000.

Venema, Harry J., to Borg-Warner Corporation. Active shock absorbing system for a vehicle. 4,637,621, Cl. 200-6.00R.

Verbout, Jerry L.: *See*—
Smith, Harry D., Jr.; and Verbout, Jerry L., 4,638,161, Cl. 250-269.000.

Verdini, Antonio S.; and Viscomi, Giuseppe C., to ENI-Ente Nazionale Idrocarburi. Retro-inverso C-terminal hexapeptide analogues of substance P. 4,638,046, Cl. 530-332.000.

Vesa, Pekka. Mass flow rate meter. 4,637,262, Cl. 73-861.730.

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Hughes, David W., 4,637,419, Cl. 137-236.100.

Vickers Systems GmbH: *See*—
Teubler, Heinz; and Schulz, Rene, 4,637,782, Cl. 417-300.000.

Victor Company of Japan, Ltd.: *See*—
Kohri, Naomichi, 4,638,385, Cl. 360-96.400.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yoshihara, Kenji; and Haneji, Yasuo, 4,638,376, Cl. 358-342.000.
Yoshitake, Yuji; Yokouchi, Kentaro; and Yoshikawa, Hiroyoshi, 4,638,374, Cl. 358-336.000.

Videocolor: *See*—
Fonda, Carlo L., 4,638,211, Cl. 313-405.000.
Pons, Claude, 4,638,219, Cl. 315-368.000.
Rousseau, Jean; and Fourche, Jean P., 4,637,803, Cl. 445-23.000.

Vidoni, Werner. Screen printing apparatus using partially saturated solvent inking atmosphere. 4,637,308, Cl. 101-114.000.

Vierkotter, Peter, to Henkel Kommanditgesellschaft auf Aktien. Dispenser for a two-component adhesive. 4,637,746, Cl. 401-82.000.

Vinogradoff, Anna P.: *See*—
Kleschick, William A.; Vinogradoff, Anna P.; and Dunbar, Joseph E., 4,638,075, Cl. 558-5.000.

Virnig, Michael J., to Henkel Corporation. Process of preparing hydroxyarylaldehydes and catalyst therefor. 4,638,096, Cl. 568-433.000.

Viscomi, Giuseppe C.: *See*—
Verdini, Antonio S.; and Viscomi, Giuseppe C., 4,638,046, Cl. 530-332.000.

Vitunac, Edward A. Device for cleaning the sizing screen of a material reduction apparatus. 4,637,557, Cl. 241-73.000.

Vogelsong, Thomas L.: *See*—
Brown, Dale M.; Kim, Manjin J.; Baertsch, Richard D.; and Vogelsong, Thomas L., 4,638,400, Cl. 361-304.000.

Vohl, Paul-Eugene. Control device for clutch. 4,637,503, Cl. 192-83.000.

Vohra, Rohini: *See*—
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Vollmer, Jurgen, to Jean Walterscheid GmbH. Coupling device for agricultural implements. 4,637,751, Cl. 403-379.000.

von der Heide, Johann, to Papst-Motoren GmbH & Co. KG. Linear DC motor. 4,638,192, Cl. 310-12.000.

Vondracek, Bohumir: *See*—
Smidrkal, Jan; Simunek, Jaroslav; Tolman, Jiri; Soucek, Jiri; Novacek, Alois; Novak, Jan; Krob, Vaclav; Kovar, Pavel; Klofec, Miroslav; and Vondracek, Bohumir, 4,637,894, Cl. 252-186.400.

Von Gentzkow, Wolfgang; Markert, Helmut; Hauschildt, Hans; and Schmiedel, Manfred, to Siemens Aktiengesellschaft. Method for radical cross-linking of organic polymers. 4,638,019, Cl. 522-104.000.

von Matuschka, Alfred G.; and Trausner, Norbert, to Elektroschmelzwerk Kempten GmbH. Process for boriding metals and metal alloys by means of solid boriding agents. 4,637,837, Cl. 148-6.000.

von Rauch, Moriz, to Siemens Aktiengesellschaft. Pressure difference measuring device with a semiconductor pressure sensor. 4,637,257, Cl. 73-706.000.

Vranson, David M.: *See*—
Foglesonger, John D.; and Vranson, David M., 4,638,273, Cl. 333-254.000.

VTC Incorporated: *See*—
Boler, Clifford H.; Leake, William W.; Rai, Surinder S.; and Zemske, Gene B., 4,638,187, Cl. 307-451.000.

Vulcan Equipment Company, Ltd.: *See*—
Bubik, Leslie, 4,637,623, Cl. 280-402.000.

Vulnax International Limited: *See*—
Sambuis, Bernard; and Gavory, Daniel, 4,638,026, Cl. 524-98.000.

W & A Bates Limited: *See*—
Trethowan, Jack, 4,637,644, Cl. 294-97.000.

W. Schlafhorst & Co.: *See*—
Derichs, Josef, 4,637,207, Cl. 57-282.000.

Wachimski, Clarence A.; and Bigger, Thomas J., to William H. Rorer, Inc. Articulated joint in aerosol medicament dispenser. 4,637,528, Cl. 222-182.000.

Wacker-Chemie GmbH: *See*—
Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, 4,637,958, Cl. 428-416.000.

Wagner, David J., to Motorola, Inc. Electronic turn signal cancellation apparatus. 4,638,290, Cl. 340-56.000.

Wagner, Ross L.: *See*—
Medvick, Richard J.; Weber, Richard C., Jr.; Wagner, Ross L.; and Brand, Edward M., 4,637,432, Cl. 137-614.030.

Wagner, Wayne M. Staple remover. 4,637,538, Cl. 227-63.000.

Wakabayashi, Hiroshi: *See*—
Kazami, Kazuyuki; and Wakabayashi, Hiroshi, 4,637,702, Cl. 354-173.110.

Walba, David M.; and Vohra, Rohini. Synthesis of new liquid crystal materials possessing phenylbenzoate or biphenyl core units and (2,3)-epoxyalkyloxiranemethanol chiral tails. 4,638,073, Cl. 549-556.000.

Walker, Clifford G.; and Tanton, George A., to United States of America, Army. Nondestructive noncontact device to characterize semiconductor material. 4,637,726, Cl. 356-367.000.

Walker, George E., to Monsanto Company. Process and device for temporarily holding and releasing objects. 4,637,944, Cl. 428-35.000.

Walker, Oliver M.: *See*—
Bunting, Franklin O.; and Hudson, J. Russell, 4,637,647, Cl. 296-24.00R.

Walker, Peter S., to Brigham & Women's Hospital. Motion-guiding load-bearing external linkage for the knee. 4,637,382, Cl. 128-92.00Z.

Walker, Samuel C.: *See*—
Ray, Charles A.; and Walker, Samuel C., 4,637,548, Cl. 239-201.000.

Wallingford Barbell Company: *See*—
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Walser, Felix, to Prazisions-Werkzeuge AG. Electrode arrangement for a coating installation. 4,637,339, Cl. 118-622.000.

Walz, Rudiger: *See*—
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Wang, An; Ho, Shu-Kuang; and Mainemer, Carlos I., to Wang Laboratories, Inc. Writing pad. 4,638,118, Cl. 178-18.000.

Wang Laboratories, Inc.: *See*—
Kayser, Dennis J., 4,638,178, Cl. 307-85.000.
Wang, An; Ho, Shu-Kuang; and Mainemer, Carlos I., 4,638,118, Cl. 178-18.000.

Wang, Pen-Chung; and Renga, James M., to Dow Chemical Company, The. Process for preparing ethylenically unsaturated heterocyclic thiocarbonyl compounds and their organo-oxylated precursors. 4,638,064, Cl. 544-54.000.

Wanninger, Ludwig: *See*—
Schmid, Eckart; and Wanninger, Ludwig, 4,638,215, Cl. 315-3.500.

Ward, Anthony T.: *See*—
Smith, Thomas W.; Ward, Anthony T.; Luca, David J.; and Johnson, Gordon E., 4,638,335, Cl. 346-135.100.

Ward, Edward F. Evaporative cooler blower rotor-shaft securing hub. 4,637,750, Cl. 403-344.000.

Ward, Mary V.; Nield, Eric; and Staniland, Philip A., to Imperial Chemical Industries PLC. Method of increasing molecular weight of poly(aryl ethers). 4,638,037, Cl. 525-471.000.

Warner Lambert Company: *See*—
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Culbertson, Townley P.; Domagala, John M.; Mich, Thomas F.; and Nichols, Jeffrey B., 4,638,067, Cl. 546-15.000.

Watabe, Masaya; and Abe, Shuichi, to Hitachi, Ltd. Data processing apparatus for processing operand store conflict. 4,638,429, Cl. 364-200.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,638,330, Cl. 346-76.0PH.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image building apparatus. 4,638,331, Cl. 346-76.0PH.

Watanabe, Masakazu; and Okuno, Akiyasu, to NGK Spark Plug Co., Ltd. Microwave absorber comprised of a dense silicon carbide body which is water cooled. 4,638,268, Cl. 333-22.00F.

Watanabe, Masanori: *See*—
Inami, Yasuhiko; Watanabe, Masanori; and Hijikigawa, Masaya, 4,638,346, Cl. 357-25.000.

Waterworth, John R., to Ferranti plc. Digital data storage apparatus. 4,638,454, Cl. 364-900.000.
Watson, John N., to Westinghouse Electric Corp. Remote control switching of television sources. 4,638,359, Cl. 358-147.000.
Wean United, Inc.: *See*—
Kerr, Robert L., 4,638,492, Cl. 373-74.000.
Weathers, Gary G.; and Rice, Billy J., to Hughes Tool Company. Subsea hydraulic coupling. 4,637,470, Cl. 166-344.000.
Webasto-Werk W. Baier GmbH & Co.: *See*—
Rathel, Dieter, 4,637,371, Cl. 126-110.00B.
Webber, Sandra: *See*—
Tartt, Evangeline; and Webber, Sandra, 4,637,076, Cl. 2-102.000.
Weber, Mark W.: *See*—
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Kubit, Raymond G., 4,637,974, Cl. 430-126.000.
Weber, Richard C., Jr.: *See*—
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Wedl, Peter: *See*—
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Weeks, Robert E.: *See*—
Hershberger, Charles L.; Merkel, Kurt E.; Weeks, Robert E.; and Wild, Gene M., 4,637,981, Cl. 435-75.000.
Wegehaupt, Karl-Heinrich; and Pfeffer, Hans-Rudolf, to Wacker-Chemie GmbH. Method for improving the adhesion of elastomers to a coated substrate. 4,637,958, Cl. 428-416.000.
Wegemund, Bernd: *See*—
Worschech, Kurt; Loeffelholz, Frido; Wedl, Peter; and Wegemund, Bernd, 4,637,887, Cl. 252-56.00R.
Wegscheider, Hans J.: *See*—
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Weidenhammer Packungen KG GmbH & Co.: *See*—
Kucherer, Helmut, 4,637,543, Cl. 229-5.600.
Weigert, Hans, to Mixed Bag Imports, Inc. Automatic pocketbook illuminator. 4,638,412, Cl. 362-156.000.
Weihrauch, Georg, to Coronet-Werke Heinrich Schlerf GmbH. Method for connecting bristles to a bristle carrier. 4,637,660, Cl. 300-21.000.
Weingartner, Fritz, to Swiss Aluminium Ltd. Process for manufacturing highly active, dispersed low apparent density aluminium hydrate. 4,637,908, Cl. 264-143.000.
Weiss, Wilhelm, to Krones AG Hermann Kronseder Maschinenfabrik. Method and device for filling containers. 4,637,438, Cl. 141-6.000.
Weller, Harold N., III; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. Ester substituted aminoalkanoylureido amino and imino acid and ester compounds. 4,638,010, Cl. 514-423.000.
Wepfer, Robert M., to Westinghouse Electric Corp. Baffle plate with eight-lobed tube-receiving openings and cold-formed flow-restricting tabs in each lobe. 4,637,457, Cl. 165-162.000.
Werner, Wolfgang: *See*—
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Wernicke & Co. GmbH: *See*—
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Wessel, Frank J.; and Hancock, Donald J., to Hughes Aircraft Company. Power-processing unit. 4,638,149, Cl. 219-499.000.
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Westinghouse Electric Corp.: *See*—
Boyle, David E.; and Chrise, James R., 4,637,914, Cl. 376-353.000.
Burke, Michael A.; and Beck, Cyril G., 4,637,448, Cl. 164-122.200.
Camden, Thomas M., Jr.; and Freeman, Thomas R., 4,637,915, Cl. 376-435.000.
Chang, George W. Y., 4,637,214, Cl. 60-687.000.
Dawson, Dale E.; Conti, Anthony L.; Lee, Soong H.; Shade, Gary F.; and Dickens, Lawrence E., 4,638,269, Cl. 333-164.000.
Draper, Robert; Lorentz, Donald G.; Baum, Allen J.; and Economy, George, 4,637,346, Cl. 122-4.00A.
Evans, Gary E., 4,638,317, Cl. 342-373.000.
Impink, Albert J., Jr., 4,637,910, Cl. 376-216.000.
Raven, Robert S., 4,638,315, Cl. 342-5.000.
Rosa, John; and Frank, William E., 4,638,138, Cl. 219-10.770.
Stoltz, Richard A.; and Kwon, Young J., 4,637,831, Cl. 75-84.500.
Takach, David S.; Boggavarapu, Rao L.; and Sinha, Ram R. P., 4,638,177, Cl. 307-83.000.
Thomas, Glenn R.; and McKee, Jere L., 4,638,277, Cl. 335-190.000.
Watson, John N., 4,638,359, Cl. 358-147.000.
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Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., 4,637,588, Cl. 251-280.000.
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Wetherington, Aubrey D. Automobile headlight-fog light combination. 4,638,408, Cl. 362-61.000.
Weyerhaeuser Company: *See*—
Brough, William R.; and Borgen, James C., 4,638,440, Cl. 364-475.000.
Whalen, Brian L. Torque feedback transmission. 4,637,275, Cl. 74-687.000.
Whirlwind, Inc.: *See*—
Ramsden, Gordon, 4,637,289, Cl. 83-380.000.
White, Dowell; Craig, Daniel L.; Duke, Jack L.; and Laurie, Donald H. Apparatus and method for converting thermal energy to mechanical energy. 4,637,211, Cl. 60-650.000.
White, James E.; Alley, Lewis F.; Anderson, James E.; and Birdsell, Jackie D., to Marlen Research Corporation. Aspetic food processing apparatus and method. 4,637,936, Cl. 426-523.000.
White, Leonard A., to Baxter Travenol Laboratories, Inc. Liquid container with integral opening apparatus. 4,637,934, Cl. 426-117.000.
White, Robert S.: *See*—
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Whiting, Carolyn C. Marking projectile. 4,637,616, Cl. 273-418.000.
Whitney, David R.; and Whitney, Ronald B., to Access Learning Technology Corporation. Software training system. 4,637,797, Cl. 434-118.000.
Whitney, Ronald B.: *See*—
Whitney, David R.; and Whitney, Ronald B., 4,637,797, Cl. 434-118.000.
Whitney, Wells, to Raychem Corporation. Modular electrical heater. 4,638,150, Cl. 219-543.000.
Whittle, Peter J.: *See*—
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Wick, Alexander: *See*—
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Wielinger, Hans: *See*—
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Wilhelm, John J.; Calhoun, Gregory L.; Dawson, Paul H.; and Kramer, Arthur W., to Westinghouse Electric Corp. Non-bolted ringless nozzle dam. 4,637,588, Cl. 251-280.000.
Wilhelm Karmann GmbH: *See*—
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Wilkins, Judd. Golf club swing training aid. 4,637,612, Cl. 273-183.00B.
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Wilkins, Scott A.: *See*—
Killen, H. Ron; Wilkins, Scott A.; and Frantz, Douglas C., 4,637,361, Cl. 123-339.000.
Wilkins, Vaughn D. Binocular eyeglasses for image magnification. 4,637,696, Cl. 351-41.000.
Wilkinson, James H.; and Gillard, Clive H., to Sony Corporation. Digital video tape recorder apparatus. 4,638,380, Cl. 360-22.000.
William H. Rorer, Inc.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,638,001, Cl. 514-212.000.
Wachinski, Clarence A.; and Bigger, Thomas J., 4,637,528, Cl. 222-182.000.
Williams, George A. Combination, a model vehicle engine and a direct-current generator. 4,638,172, Cl. 290-1.00R.
Willis, David: *See*—
Nimmo, Neil D.; Kenny, Michael; and Willis, David, 4,637,178, Cl. 52-36.000.
Willis, Donald H.: *See*—
Christopher, Todd J.; Willis, Donald H.; and Fling, Russell T., 4,638,360, Cl. 358-148.000.
Wilmot, Stephen B.: *See*—
Perra, Raymond C.; Wilmot, Stephen B.; and Games, John E., 4,638,430, Cl. 364-300.000.
Wilson, Harry W.: *See*—
Topham, Arnold. J.; and Wilson, Harry W., 4,637,328, Cl. 111-89.000.
Wilson, Jerry F.; and Schuster, Richard L., to Manville Sales Corporation. Wrap-around carrier with improved handle. 4,637,515, Cl. 206-434.000.
Wilson, Ronald A.: *See*—
Mitchell, Gregory N.; and Wilson, Ronald A., 4,637,570, Cl. 244-1.0TD.
Windischmann, Henry: *See*—
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Winfield Corporation: *See*—
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Winters, Arthur R., Jr.: *See*—
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Winzenburg, Mark L.: *See*—
Fields, Ellis K.; Winzenburg, Mark L.; and Behrend, Steven J., 4,638,072, Cl. 549-234.000.

Winzer, Gerhard: *See—*
Mahlein, Hans F.; Reichelt, Achim; and Winzer, Gerhard, 4,637,682, Cl. 350-96.150.

Wirth Maschinen- und Bohrgerate-Fabrik GmbH: *See—*
Tibussek, Fritz, 4,637,659, Cl. 299-89.000.

Wise, Dan S.; and Miller, George A., to Wise Industries, Inc. Method and apparatus for cleaning cotton. 4,637,096, Cl. 19-200.000.

Wise Industries, Inc.: *See—*
Wise, Dan S.; and Miller, George A., 4,637,096, Cl. 19-200.000.

Wistar Institute of Anatomy and Biology: *See—*
O'Brien, Thomas G.; Pegg, Anthony E.; and Herlyn, Meehard, 4,637,984, Cl. 435-240.000.

Witkoski, Edward J.; and Lizotte, Edgar G., to Simplex Security Systems, Inc. Door locking system. 4,637,237, Cl. 70-285.000.

Witter, David E.; and Levine, Jules D., to Texas Instruments Incorporated. Process for producing crystalline silicon spheres. 4,637,855, Cl. 156-616.00R.

Wohlabaugh, Leonard M.: *See—*
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Wohrle, Albert, to J. M. Voith GmbH. Scraping apparatus. 4,637,338, Cl. 118-126.000.

Wohrstein, Franz X.: *See—*
Pasternak, Stephen F.; and Wohrstein, Franz X., 4,637,111, Cl. 29-157.30A.

Wolfrum, Gerhard: *See—*
Skjold, A. Christopher; Hugl, Herbert; and Wolfrum, Gerhard, 4,637,979, Cl. 435-19.000.

Wolsey, Clarence K. Stretcher bars. 4,637,147, Cl. 38-102.100.

Wong, Lam F., to Xerox Corporation. Four point support for copiers and the like. 4,637,581, Cl. 248-188.300.

Wong, Wilbur. Personal binocular support. 4,637,536, Cl. 224-262.000.

Wood, Eric, to Insituform Holdings Limited. Lining of pipelines and passageways. 4,637,754, Cl. 405-150.000.

Wood, Michael D. Crimping and cutting tool. 4,637,084, Cl. 7-134.000.

Woodall, Jerry M.: *See—*
Freeouf, John L.; Jackson, Thomas N.; Laux, Steven E.; and Woodall, Jerry M., 4,638,342, Cl. 357-15.000.

Woodbury, Howard A.: *See—*
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Woods, Daniel L.: *See—*
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Wooge, Christian: *See—*
Speisebecher, Joachim; and Wooge, Christian, 4,637,745, Cl. 401-1.000.

Worrell, Williams R.; Laroche, Robert N.; and Armstrong, Michael J., to All-Steel Canada Ltd. Office furniture desk top with adjustable CRT carriage and tracking arrangement therefor. 4,637,666, Cl. 312-196.000.

Worschech, Kurt; Loeffelholz, Frido; Wedl, Peter; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien. Lubricants for vinyl chloride polymers. 4,637,887, Cl. 252-56.00R.

Wortmann, Johannes, to Wilhelm Karmann GmbH. Method of operating industrial robots, and industrial robot for carrying out the method. 4,637,121, Cl. 29-568.000.

Wright, Charles S., to Delta Electronics. Fully compatible AM stereophonic transmitting system. 4,638,503, Cl. 381-16.000.

Wright, William: *See—*
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Wroblowsky, Heinz-Jurgen: *See—*
Stetter, Jorg; Wroblowsky, Heinz-Jurgen; Schmidt, Robert R.; Santel, Hans-Joachim; Hanssler, Gerd; and Lurssen, Klaus, 4,638,004, Cl. 514-272.000.

Wu, Leonard L., to American Motors Corporation. Wiper arm assembly and system utilizing same. 4,637,091, Cl. 15-250.340.

Wu, Muyen M.: *See—*
Li, George S.; Wu, Muyen M.; and De Witt, Elmer J., 4,638,042, Cl. 526-280.000.

Wuertz, Howard A.: *See—*
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Wulc, Stanley S.: *See—*
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Wurll, Peter: *See—*
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Wyman, Floyd H.: *See—*
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Wynn, David K.: *See—*
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,637,961, Cl. 428-579.000.

XCO International, Inc.: *See—*
Davis, Bayard C., 4,638,107, Cl. 136-237.000.

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Xerox Corporation: *See—*
Burnham, Robert D.; Paoli, Thomas L.; Thornton, Robert L.; and Sprague, Robert A., 4,638,334, Cl. 346-108.000.
Connell, G. A. Neville; and Godwin, Jimmy D., 4,638,470, Cl. 369-13.000.
Drake, Donald J.; Hawkins, William G.; Markham, Roger G.; and LaDonna, Richard V., 4,638,328, Cl. 346-75.000.
Elrod, Scott A., 4,638,338, Cl. 346-140.00R.
Feng, I-an, 4,638,333, Cl. 346-76.0PH.
Foley, Geoffrey M. T., 4,638,397, Cl. 361-212.000.
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Torpey, Peter A.; and Markham, Roger G., 4,638,337, Cl. 346-140.00R.
Wong, Lam F., 4,637,581, Cl. 248-188.300.

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Yagasaki, Toshiaki: *See—*
Shimizu, Katsuichi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,638,368, Cl. 358-256.000.

Yamada, Hideaki; and Tani, Yoshiki, to Yamada, Hideaki; and Nitto Kagaku Kogyo Kabushiki Kaisha, a part interest. Process for biological preparation of amides. 4,637,982, Cl. 435-129.000.

Yamada, Keiichi: *See—*
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Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, to Hitachi, Ltd.; Hitachi Seiko Ltd.; and Hitachi Koki Co., Ltd. Ink jet recording apparatus. 4,638,326, Cl. 346-75.000.

Yamada, Takahiro: *See—*
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Yamada, Wazoh: *See—*
Hosoya, Yoshinori; Tunekawa, Shyozi; Yamada, Wazoh; and Shiraishi, Akira, 4,637,223, Cl. 62-263.000.

Yamagata, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Method for making a composite cylinder block. 4,637,110, Cl. 29-156.4WL.

Yamagishi, Kagari: *See—*
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Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Slant plate type hydraulic device. 4,637,293, Cl. 91-507.000.

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Odashima, Rou, 4,637,355, Cl. 123-73.0AD.
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Yamamoto, Noboru; and Yamasaki, Tetsuya, to Nippon Sheet Glass Co., Ltd. Optical plane circuit with an optical coupler and a method for manufacturing the same. 4,637,681, Cl. 350-96.120.

Yamamoto, Noboru: *See—*
Yamaguchi, Kouji; Kawahara, Eiichiro; and Yamamoto, Noboru, 4,637,293, Cl. 91-507.000.

Yamamoto, Satoru: *See—*
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Yamamoto, Wataru, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Supercharge pressure control apparatus of a supercharged engine. 4,637,210, Cl. 60-602.000.

Yamamoto, Yoko: *See—*
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Yamamoto, Yoshiaki: *See—*
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Yamashita, Akira: *See—*
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Yamashita, Sadahiko: *See—*
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Yamazaki, Etuo, to Fanuc Ltd. Function diagnosing system. 4,638,455, Cl. 364-900.000.
Yamazaki, Kazuhiro: *See*—
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Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device. 4,638,108, Cl. 136-244.000.
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Ling, Hung C.; and Yan, Man F., 4,638,401, Cl. 361-321.000.
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Yang, Chi C.: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi C.; Fournier, Jeffrey; and Kulman, James, 4,637,895, Cl. 252-188.310.
Yang, Tai-Her. Easily disassemblable separate ceiling fan switch box structure and an electrical connector therefor. 4,637,673, Cl. 339-89.00M.
Yang, Yihong: *See*—
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Yanglin, Dennis W.: *See*—
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Yano, Yoshiki; and Oikawa, Toshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Spark plug cap apparatus. 4,637,358, Cl. 123-169.0PA.
Yaotani, Kouichi; Nakada, Fumio; Tanaka, Takao; and Yoshida, Minoru, to Topura Co., Ltd. Threaded fastener. 4,637,767, Cl. 411-411.000.
Yasukawa, Kazuyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Lifting head of swivel arm of assembly robot. 4,637,771, Cl. 414-590.000.
Yasuoka, Akimasa; Iwata, Takahiro; and Kiuchi, Takeo, to Honda Kiken Kogyo Kabushiki Kaisha. Method for controlling the supply of fuel for an internal combustion engine. 4,637,362, Cl. 123-478.000.
Yeh, Lun-Shu R.; Grenness, Morten; and Fuller, Robert J., to Allied Corporation. Lead-titanium, bipolar electrode in a lead-acid battery. 4,637,970, Cl. 429-153.000.
Yenzer, Scott H. Helicopter airmobile work platform for working on power lines and tower structures. 4,637,575, Cl. 244-118.500.
Yinko, Richard H., Sr. Ladle cup for pouring molten metal. 4,637,593, Cl. 266-275.000.
Yokogawa Medical Systems, Limited: *See*—
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Yokouchi, Kentaro: *See*—
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Yoshikawa, Hayato; and Morisaka, Manabu, Toyota Jidosha Kabushiki Kaisha. Windshield defroster. 4,637,2[illegible], Cl. 98-2.080.
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Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing a derivative of para-aminobenzoic acid as an active ingredient. 4,637,998, Cl. 514-42.000.
Yoshimura, Yasuo; Yamauchi, Kunio; and Saito, Kenji, to Hitachi Denshi Kabushiki Kaisha. Automatic iris adjustment system. 4,638,366, Cl. 358-228.000.
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Yoshitake, Yuji; Yokouchi, Kentaro; and Yoshikawa, Hiroyoshi, to Victor Company of Japan, Ltd. Defect detecting apparatus for a rotary recording medium. 4,638,374, Cl. 358-336.000.
Yuasa, Kazuhiro, to Ricoh Company, Ltd. One-component copier toner with electric field transfer. 4,637,708, Cl. 355-3.0DD.
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Yunick, Henry, to MotorTech, Inc. Fuel conditioning apparatus and method. 4,637,365, Cl. 123-545.000.
Zabotto nee Arribau, Arlette; Contamin, Jean-Claude; Zaffran, Christian; and Koulbanis, Constantin, to L'Oreal. Composition for cleaning the skin. 4,637,933, Cl. 424-131.000.
Zadworny, Francois: *See*—
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Zeidler, Georg: *See*—
Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, 4,638,055, Cl. 534-678.000.
Zeigler, Theodore R. Clip for self-locking collapsible/expandable structures. 4,637,180, Cl. 52-109.000.
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Zemske, Gene B.: *See*—
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Zettel, Hans-Dieter: *See*—
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Zinonos, George: *See*—
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Zirk, Elisabeth: *See*—
Olschewski, Armin; Bauer, Bernhard; Zirk, Elisabeth; and Heemskerk, Rut, 4,637,740, Cl. 384-425.000.
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Zoller, Steven A.: *See*—
Kirkpatrick, Steven J.; Zoller, Steven A.; and Woods, Daniel L., 4,637,935, Cl. 426-443.000.
Zottnik, Edmund, to Licentia Patent-Verwaltungs-GmbH. Accident data recorder. 4,638,289, Cl. 340-52.00H.
Zucchini, Guido, to AMA Universal S.p.A. Apparatus for the recycling of solvent used in dry-cleaning machines and similar equipment. 4,637,232, Cl. 68-18.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JANUARY, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Deyrup, Edward J., to Du Pont de Nemours, E. I., and Company. Molding resins. Re. 32,334, Cl. 524-292.000.

Du Pont de Nemours, E. I., and Company: *See*—
Deyrup, Edward J., Re. 32,334, Cl. 524-292.000.

Eli Lilly and Company: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,333, Cl. 530-321.000.

Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. A-21978 Antibiotics and process for their production. Re. 32,333, Cl. 530-321.000.

Hoehn, Marvin M.: *See*—
Hamill, Robert L.; and Hoehn, Marvin M., Re. 32,333, Cl. 530-321.000.

Kato, Masami, to Toska Co., Ltd. Cluster type tag pin assembly. Re. 32,332, Cl. 206-346.000.

Toska Co., Ltd.: *See*—
Kato, Masami, Re. 32,332, Cl. 206-346.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bechthold, Horst; and Bottger, Paul, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Method of removing SO_2 and/or other acid components from waste gases. B1 4,039,304, 1-20-87, Cl. 55-10.000.

Bottger, Paul: *See*—
Bechthold, Horst; and Bottger, Paul, B1 4,039,304, Cl. 55-10.000.

Carl Freudenberg, Firma: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

Fortel Corp.: *See*—
Hanscom, Bradford E., B1 4,451,707, Cl. 179-84.00R.

Hall, Randall C., to Purdue Research Foundation. Electrolytic conductivity detector system. B1 4,032,296, 1-20-87, Cl. 422-89.000.

Hanscom, Bradford E., to Fortel Corp. Ring detector and telephone line monitoring system for telephone answering instrument. B1 4,451,707, 1-20-87, Cl. 179-84.00R.

Kohl, Edgar: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See*—
Bechthold, Horst; and Bottger, Paul, B1 4,039,304, Cl. 55-10.000.

Purdue Research Foundation: *See*—
Hall, Randall C., B1 4,032,296, Cl. 422-89.000.

Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, to Carl Freudenberg, Firma. Gas filter element. B1 4,056,375, 1-20-87, Cl. 55-381.000.

Rutsch, Peter: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

Schneider, Rolf: *See*—
Ringel, Wolfgang; Rutsch, Peter; Schneider, Rolf; and Kohl, Edgar, B1 4,056,375, Cl. 55-381.000.

LIST OF DESIGN PATENTEES

Aadahl, Frank P.: *See*—
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Alexander, Frederick D., to Ekco Products, Inc. Roaster. 287,809, 1-20-87, Cl. D7-359.000.

Amano, Hiroki: *See*—
Katoh, Mitsuo; and Amano, Hiroki, 287,843, Cl. D12-163.000.

Arita, Toyomi: *See*—
Fujii, Ichiro; Yajima, Hiroshi; and Arita, Toyomi, 287,893, Cl. D32-21.000.

Arnaud, Daniel. Tooth brush. 287,791, 1-20-87, Cl. D4-107.000.

Arnaud, Daniel. Tooth brush. 287,792, 1-20-87, Cl. D4-107.000.

Atlantic Vacuum Parts Corp.: *See*—
Genoa, Joseph; Kaskel, Harold; and Nelson, Carl, 287,896, Cl. D32-32.000.

Atmos Fritzsching & Co. GmbH: *See*—
Schwan, Bernhard, 287,830, Cl. D10-57.000.

Ava Tech International Ltd.: *See*—
Stephan, Gerhard, 287,831, Cl. D11-130.100.

Baxter Travenol Laboratories, Inc.: *See*—
Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., 287,882, Cl. D24-61.000.

Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Motor housing for canister type electric vacuum cleaner. 287,895, 1-20-87, Cl. D32-25.000.

Bianchi Scarpa, Afra; and Scarpa, Tobia, to Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S. Store front. 287,883, 1-20-87, Cl. D25-9.000.

Black & Decker, Inc.: *See*—
Osit, Robert, 287,810, Cl. D7-412.000.

Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., to Johnson & Johnson Dental Products Company. Combined holder and dispenser for dental composite material cartridge. 287,874, 1-20-87, Cl. D24-10.000.

Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., to Johnson & Johnson Dental Company. Combined holder and dispenser for dental composite material cartridge. 287,875, 1-20-87, Cl. D24-10.000.

Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., to Johnson & Johnson Dental Company. Single dose cartridge for dental composite material. 287,876, 1-20-87, Cl. D24-10.000.

Blatherwick, William J.: *See*—
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 287,821, Cl. D9-341.000.
Holewinski, Robert D.; Weissenburger, Edward A.; and Blatherwick, William J., 287,877, Cl. D24-14.000.

Bobinac, William. Pontoon. 287,847, 1-20-87, Cl. D12-317.000.

Bolduc, Pierre-Yves. Hurricane lamp. 287,885, 1-20-87, Cl. D26-11.000.

Bordonaro, Frank; and McTiernan, James, to Hoffmann-La Roche Inc. Safety bottle cap remover. 287,812, 1-20-87, Cl. D8-40.000.

Borin, Harlan F. Water carafe. 287,806, 1-20-87, Cl. D7-317.000.

Braxton, Charles R.; Puszman, Alan Z.; and Johnk, William A., to Valleylab, Inc. Electrosurgical handle. 287,879, 1-20-87, Cl. D24-30.000.

Broden, David A., to Rosemount Inc. Head for a differential pressure measuring and transmitting housing. 287,827, 1-20-87, Cl. D10-46.000.

Brown, Wilbert C.; and Saba, Philip B., to TIE/Communications, Inc. Telephone station set. 287,852, 1-20-87, Cl. D14-58.000.

Brunner, Merlin A.; and Draheim, Harvey J., to Simmons Universal Corporation. Crib footboard. 287,799, 1-20-87, Cl. D6-505.000.

Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., to Dynacast International Limited. Screw-threaded insert. 287,818, 1-20-87, Cl. D8-385.000.

Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., to Dynacast International Limited. Screw-threaded insert. 287,819, 1-20-87, Cl. D8-385.000.

Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., to Dynacast International Limited. Screw-threaded insert. 287,820, 1-20-87, Cl. D8-385.000.

Byrd, Margaret A. H. Vehicle. 287,832, 1-20-87, Cl. D12-83.000.

Calzado Puma, S.A. de C.V.: *See—*
Palacio, Jorge E. M., 287,782, Cl. D2-309.000.
Palacio, Jorge E. M., 287,783. Cl. D2-309.000.

Carris, Bonnis S.: *See—*
Johannsen, Donald R., 287,815, Cl. D8-93.000.

Carter, Henry P. Door controlled flag for mailbox. 287,898, 1-20-87, Cl. D99-29.000.

Castor, Dennis B.; and Harper, John W., to NuTone Inc. Combination ceiling light and vent grille. 287,888, 1-20-87, Cl. D26-59.000.

Cavaliere, Mario P. Head ornament. 287,891, 1-20-87, Cl. D28-41.000.

Cedrone, Louis A.; and Vahjen, Bruce J., to PepsiCo, Inc. Vending machine for beverages or the like. 287,863, 1-20-87, Cl. D20-5.000.

Centro Studi e Servizi Moda di Paolo Bertagnin & C. S.A.S.: *See—*
Bianchi Scarpa, Afra; and Scarpa, Tobia, 287,883, Cl. D25-9.000.

Chan, Wilfred; Marr, Michael; and De Sousa, Augusto, to Fortress Scientific Limited. Motorized wheelchair. 287,836, 1-20-87, Cl. D12-131.000.

Charles of the Ritz Group Ltd.: *See—*
Wollersheim, Larry D., 287,867, Cl. D21-198.000.

Chasen, Lee R., to Coats & Clark, Inc. Cup hook. 287,816, 1-20-87, Cl. D8-367.000.

Coats & Clark, Inc.: *See—*
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Colnaghi, Mario, to Eurostil, S.r.l. Telephone figure pull toy. 287,865, 1-20-87, Cl. D21-111.000.

Convergent Technologies, Inc.: *See—*
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., 287,848, Cl. D13-11.000.

Cragin, Richard O., to Textron Inc. Handle for an article of flatware. 287,804, 1-20-87, Cl. D7-152.000.

Crevling, Robert L., Jr.: *See—*
Berfield, Robert C.; Meland, Ronald F.; and Crevling, Robert L., Jr., 287,895, Cl. D32-25.000.

Crews, Jay A. Keyboard. 287,854, 1-20-87, Cl. D14-100.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Covered serving tray or the like. 287,802, 1-20-87, Cl. D7-17.000.

Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., to Dart Industries Inc. Casserole dish cover or the like. 287,803, 1-20-87, Cl. D7-40.000.

Dart Industries Inc.: *See—*
Daenen, Robert H. C. M., 287,802, Cl. D7-17.000.
Daenen, Robert H. C. M.; DeCoster, Pieter K. J.; and Wolff, Martin J., 287,803, Cl. D7-40.000.

DeCoster, Pieter K. J.: *See—*
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Design Institute America, Inc.: *See—*
Evans, Paul R., 287,796, Cl. D6-483.000.
Evans, Paul R., 287,797, Cl. D6-483.000.

De Sousa, Augusto: *See—*
Chan, Wilfred; Marr, Michael; and De Sousa, Augusto, 287,836, Cl. D12-131.000.

De Vos, Hendrik A. J., to GTE Products Corporation. Luminaire reflector. 287,890, 1-20-87, Cl. D26-118.000.

Dr. Anso Zimmermann Isolierflaschen: *See—*
Zimmermann, Anso, 287,805, Cl. D7-317.000.

Doi, Tetsuyuki: *See—*
Hiraishi, Etsuo; Doi, Tetsuyuki; and Morikawa, Hiroshi, 287,814, Cl. D8-67.000.

Doyle, Donald E. Nose tampon. 287,880, 1-20-87, Cl. D24-51.000.

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Dunchock, Richard S., to SL Corporation. Cassette tape holder. 287,787, 1-20-87, Cl. D3-35.000.

Dunn, Paul M.: *See—*
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Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,820, Cl. D8-385.000.

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Bullen, Stephen R.; Dunn, Paul M.; and Phillips, Martin A., 287,820, Cl. D8-385.000.

Ekco Products, Inc.: *See—*
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Elec & Eltek Company Limited: *See—*
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Eriksson, Stellan, to Indoor Innovation Aktiebolag. Sealing device for surrounding the point of emergence of a pipe from a wall or floor. 287,872, 1-20-87, Cl. D23-40.000.

Eurostil, S.r.l.: *See—*
Colnaghi, Mario, 287,865, Cl. D21-111.000.

Evans, Paul R., to Design Institute America, Inc. Table. 287,796, 1-20-87, Cl. D6-483.000.

Evans, Paul R., to Design Institute America, Inc. Table. 287,797, 1-20-87, Cl. D6-483.000.

Farber, Robert J. Candy. 287,780, 1-20-87, Cl. D1-106.000.

Fay, Andreas, to Lever Brothers Company. Toothbrush. 287,790, 1-20-87, Cl. D4-104.000.

Flan Tovarna Sportnega Orodja n.sol.o.: *See—*
Robic, Andrej, 287,869, Cl. D21-229.000.

Fortress Scientific Limited: *See—*
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Freige, Diab E.: *See—*
Keely, Leroy B.; Freige, Diab E.; and Nuttall, Michael J., 287,848, Cl. D13-11.000.

Fujii, Ichiro; Yajima, Hiroshi; and Arita, Toyomi, to Sanyo Electric Co., Ltd. Portable vacuum cleaner. 287,893, 1-20-87, Cl. D32-21.000.

Gauer, Edward H., Jr.: *See—*
Rosa, Richard L.; and Gauer, Edward H., Jr., 287,892, Cl. D32-17.000.

Gautestad, Arild O. Transparency mount for overhead projectors. 287,858, 1-20-87, Cl. D16-26.000.

Genoa, Joseph; Kaskel, Harold; and Nelson, Carl, to Atlantic Vacuum Parts Corp. Vacuum cleaner hose adapter. 287,896, 1-20-87, Cl. D32-32.000.

Gillotti, Nathan J., to Spinair Corporation. Pollutant collector for cleaning air rising from kerosene heater. 287,873, 1-20-87, Cl. D23-127.000.

Glash, Dean M.; Kruger, Robert J.; Olson, Steven L.; and West, Richard L., to Baxter Travenol Laboratories, Inc. Needle hub. 287,882, 1-20-87, Cl. D24-61.000.

Goldstein, Paul. Collapsible lampshade. 287,889, 1-20-87, Cl. D26-118.000.

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GTE Products Corporation: *See—*
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Hagg, Jan O.; and Persson, Lars-Olov, to Pressmaster Tool AB. Crimping tool. 287,813, 1-20-87, Cl. D8-51.000.

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Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,874, Cl. D24-10.000.
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,875, Cl. D24-10.000.
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,876, Cl. D24-10.000.
Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., 287,821, Cl. D9-341.000.

Hanifi, Paul H., to Sage Products, Inc. Needle/syringe collection container. 287,897, 1-20-87, Cl. D34-1.000.

Harper, John W.: *See—*
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Harris Hardware Sales Corp.: *See—*
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Hashimoto, Masanori, to Ricoh Company, Ltd. Electrophotographic copying machine. 287,859, 1-20-87, Cl. D16-31.000.

Hatakenaka, Kenji, to Sumitomo Rubber Industries. Automobile tire. 287,842, 1-20-87, Cl. D12-151.000.

Hauser, Mark W.; and Windorski, David C., to Minnesota Mining and Manufacturing Company. Desk tray. 287,862, 1-20-87, Cl. D19-78.000.

Henin, Kirk, to Harris Hardware Sales Corp. Frame mounting bracket for a swinging door. 287,817, 1-20-87, Cl. D8-380.000.

Hestair Kiddicraft Limited: *See—*
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Hiraishi, Etsuo; Doi, Tetsuyuki; and Morikawa, Hiroshi, to Ryobi Ltd. Electric drill. 287,814, 1-20-87, Cl. D8-67.000.

Hoffmann-La Roche Inc.: *See—*
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Hoi, Winter W. Y., to Elec & Eltek Company Limited. Handset and stand telephone unit. 287,851, 1-20-87, Cl. D14-53.000.

Holewinski, Robert D.; Hamilton, Leslie; and Blatherwick, William J., to Johnson & Johnson Dental Products Company. Packaging container for a bottle or the like. 287,821, 1-20-87, Cl. D9-341.000.

Holewinski, Robert D.; Weissenburger, Edward A.; and Blatherwick, William J., to Johnson & Johnson Dental Products Company. Dental syringe. 287,877, 1-20-87, Cl. D24-14.000.

Holewinski, Robert D.: *See—*
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Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,875, Cl. D24-10.000.
Blatherwick, William J.; Hamilton, Leslie; and Holewinski, Robert D., 287,876, Cl. D24-10.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ito, Kentaro; and Sasaki, Chiharu, 287,834, Cl. D12-110.000.
Makita, Akio; Nishino, Toru; and Nakazawa, Tetsuya, 287,835, Cl. D12-110.000.

Husbands, Calvin G. Flip card file holder. 287,861, 1-20-87, Cl. D19-76.000.

Hybrinetics, Inc.: *See—*
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Igloo Corporation: *See*—
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Inoue, Junichi, to Yotsuwa Sangyo & Co., Ltd. Cutter for a sheet of film, paper, plastic or the like. 287,857, 1-20-87, Cl. D15-139.000.
Ito, Kentaro; and Sasaki, Chiharu, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 287,834, 1-20-87, Cl. D12-110.000.
Johannsen, Donald R., to Carris, Bonnis S. Knife blade sharpener or the like. 287,815, 1-20-87, Cl. D8-93.000.
Johnk, William A.: *See*—
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Johnson, Jon T. Drink cup holder for an automobile. 287,789, 1-20-87, Cl. D3-40.000.
Johnson, Robert E. Picture frame. 287,793, 1-20-87, Cl. D6-303.000.
Kaskel, Harold: *See*—
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Katoh, Mitsuo; and Amano, Hiroki, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 287,843, 1-20-87, Cl. D12-163.000.
Katz, Stanley A., to Igloo Corporation. Container for refrigerant gel or the like. 287,822, 1-20-87, Cl. D9-407.000.
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Knight, Willard C. Cigarette lighter holder. 287,786, 1-20-87, Cl. D3-106.000.
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Lindheimer, Thom. Mailbox cover. 287,899, 1-20-87, Cl. D99-30.000.
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Makita, Akio; Nishino, Toru; and Nakazawa, Tetsuya, to Honda Giken Kogyo Kabushiki Kaisha. Motor tricycle. 287,835, 1-20-87, Cl. D12-110.000.
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Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Front fender for an automobile. 287,844, 1-20-87, Cl. D12-184.000.
Matsumoto, Kintaro; Kato, Mitsuo; and Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Front fender for an automobile. 287,845, 1-20-87, Cl. D12-184.000.
McMahon, Gordon E. Motorcycle light. 287,886, 1-20-87, Cl. D26-28.000.
McShirley, Susan. Pen. 287,860, 1-20-87, Cl. D19-42.000.
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O'Brien, Beverly K. Pajama bag/pillow. 287,801, 1-20-87, Cl. D6-597.000.
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O'Malley, Kieran; Preisler, John; and Larkin, Bernie, to Northern Telecom Limited. Communications headset. 287,849, 1-20-87, Cl. D14-36.000.
Ono, Masaharu, to Sumitomo Rubber Industries, Ltd. Automobile tire. 287,840, 1-20-87, Cl. D12-147.000.
Ono, Masaharu, to Sumitomo Rubber Industries, Ltd. Automobile tire. 287,841, 1-20-87, Cl. D12-147.000.
Osaka, Kazumi, to Sharp Corporation. Combined electronic thermometer and cover therefor. 287,829, 1-20-87, Cl. D10-57.000.
Osit, Robert, to Black & Decker, Inc. Base for kitchen appliance. 287,810, 1-20-87, Cl. D7-412.000.
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Palacio, Jorge E. M., to Calzado Puma, S.A. de C.V. Shoe. 287,783, 1-20-87, Cl. D2-309.000.
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Rayner, Adrien P., to Metal Box p.l.c. Container for liquids. 287,825, 1-20-87, Cl. D9-428.000.
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ISSUED JANUARY 20, 1987

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202 4,637,535
262 4,637,536

CLASS 226

76 4,637,537

CLASS 227

63 4,637,538
156 4,637,539

CLASS 228

49.2 4,637,540
180.1 4,637,541
4,637,542

CLASS 229

5.6 4,637,543
44 R 4,637,544

CLASS 232

43.2 4,637,545

CLASS 235

145 R 4,638,151

CLASS 236

49 4,637,546

CLASS 239

1 4,637,547
201 4,637,548
230 4,637,549
265.37 4,637,550
288.5 4,637,551
428.5 4,637,552
533.4 4,637,553
585 4,637,554

CLASS 241

46.02 4,637,555
48 4,637,556
73 4,637,557
79 4,637,558
94 4,637,559
100 4,637,560
154 4,637,561
259.2 4,637,562

CLASS 242

4 B 4,637,563
25 A 4,637,564
55.1 4,637,565
56 R 4,637,566
4,637,567
68.5 4,637,568
84.2 A 4,637,569

CLASS 244

1 TD 4,637,570
3.16 4,637,571
3.22 4,637,572
54 4,637,573
104 FP 4,637,574
118.5 4,637,575
145 4,637,576
147 4,637,577

CLASS 246

391 4,637,578
452 4,637,579

CLASS 248

95 4,637,580
188.3 4,637,581
315 4,637,582
544 4,637,583
559 4,637,584

CLASS 249

10 4,637,585
159 4,637,586

CLASS 250

214 A 4,638,152
227 4,638,153
4,638,154
231 SE 4,638,155
235 4,638,156
236 4,638,157
266 4,638,158
269 4,638,159
269 4,638,161
296 4,638,160
327.2 4,638,162
337 4,638,163
366 4,638,164
370 4,638,165
515.1 4,638,166
551 4,638,167
560 4,638,168
4,638,169
566 4,638,170
4,638,171

CLASS 251

29 4,637,587
280 4,637,588

CLASS 252

8.514 4,637,882
8.515 4,637,883
12 4,637,884
32.5 4,637,885
51.5 A 4,637,886
56 R 4,637,887
70 4,637,888
75 4,637,889
90 4,637,890
135 4,637,891
139 4,637,892
182 4,637,893
186.4 4,637,894
188.31 4,637,895
299.63 4,637,897
299.7 4,637,896
301.36 4,637,898
542 4,637,899
643 4,637,900

CLASS 256

59 4,637,589

CLASS 260

544 C 4,637,901
545 R 4,637,902

CLASS 261

24 4,637,903

CLASS 264

1.4 4,637,904
4.3 4,637,905
29.1 4,637,906
45.7 4,637,907
143 4,637,908
510 4,637,909

CLASS 266

45 4,637,590
165 4,637,591
272 4,637,592
275 4,637,593

CLASS 267

47 4,637,594
52 4,637,595
160 4,637,596

CLASS 269

32 4,637,597

CLASS 271

3.1 4,637,598
5 4,637,599
93 4,637,600
160 4,637,601
238 4,637,602

CLASS 272

1 R 4,637,603
73 4,637,604
4,637,605
75 4,637,606
132 4,637,607
134 4,637,608

CLASS 273

26 C 4,637,610
143 R 4,637,611
183 B 4,637,612
239 4,637,613
271 4,637,614
272 4,637,609
407 4,637,615
418 4,637,616

CLASS 277

150 4,637,617
152 4,637,618
167.5 4,637,619

CLASS 279

1 DA 4,637,620

CLASS 280

33.99 B 4,637,622
298 4,637,624
402 4,637,623
411 C 4,637,625
655 4,637,626
686 4,637,627
689 4,637,628
801 4,637,629
807 4,637,630

CLASS 281

15 R 4,637,631
45 4,637,632

CLASS 283

81 4,637,633
98 4,637,634
101 4,637,635

CLASS 285

38 4,637,636
47 4,637,637
158 4,637,638
249 4,637,639
319 4,637,640
337 4,637,641

CLASS 290

1 R 4,638,172
52 4,638,173

CLASS 292

129 4,637,642

CLASS 294

75 4,637,643
97 4,637,644
104 4,637,645

CLASS 295

37 4,637,646

CLASS 296

24 R 4,637,647
63 4,637,648
224 4,637,649

CLASS 297

90 4,637,652
334 4,637,653
337 4,637,654
410 4,637,650
4,637,655
458 4,637,651

CLASS 299

1 4,637,656
31 4,637,657
79 4,637,658
89 4,637,659

CLASS 300

21 4,637,660

CLASS 303

6 R 4,637,662
24 A 4,637,661
106 4,637,663
111 4,637,664

CLASS 305

54 4,637,665

CLASS 307

10 LS 4,638,174
10 SB 4,638,179
64 4,638,175
4,638,176
83 4,638,177
85 4,638,178
219.1 4,638,180
243 4,638,181
270 4,638,182
291 4,638,183
297 4,638,184
352 4,638,185
446 4,638,186
451 4,638,187
453 4,638,188
465 4,638,189
512 4,638,190
602 4,638,191

CLASS 310

12 4,638,192
15 4,638,193
40 R 4,638,194
49 R 4,638,195
50 4,638,196
67 R 4,638,197
91 4,638,199
156 4,638,200
216 4,638,201
235 4,638,202
239 4,638,203
4,638,204
312 4,638,205
313 B 4,638,206
328 4,638,207
871 4,638,198

CLASS 312

196 4,637,666
217 4,637,667

CLASS 313

116 4,638,208
359.1 4,638,209
362.1 4,638,210
405 4,638,211
408 4,638,212
479 4,638,213
487 4,638,214

CLASS 315

3.5 4,638,215
111.81 4,638,216
4,638,217
169.4 4,638,218
368 4,638,219
411 4,638,220

CLASS 318

48 4,638,221
111 4,638,222
254 4,638,223
4,638,224
341 4,638,225
345 R 4,638,226
565 4,638,227
569 4,638,228
584 4,638,229
632 4,638,230
640 4,638,231
4,638,232
644 4,638,233
661 4,638,234
696 4,638,235

CLASS 320

21 4,638,236
48 4,638,237

CLASS 323

211 4,638,238
281 4,638,239
289 4,638,240
312 4,638,241

CLASS 324

51 4,638,242
4,638,243
4,638,244
4,638,245
73 R 4,638,246
4,638,247
76 R 4,638,248
166 4,638,249
207 4,638,250
306 4,638,251
318 4,638,252
4,638,253
323 4,638,254

CLASS 328

36 4,638,255
105 4,638,256

CLASS 330

61 R 4,638,257
149 4,638,258
253 4,638,259
254 4,638,260
277 4,638,261

CLASS 331

65 4,638,262
116 R 4,638,263
117 D 4,638,264

CLASS 332

7.51 4,638,266

CLASS 333

1.1 4,638,267
22 F 4,638,268
164 4,638,269
175 4,638,270
205 4,638,271
214 4,638,265
236 4,638,272
254 4,638,273

CLASS 335

52 4,638,274
151 4,638,275
4,638,276
190 4,638,277
207 4,638,278

257 4,638,279
284 4,638,280
303 4,638,281

CLASS 336

185 4,638,282

CLASS 337

162 4,638,283

CLASS 338

21 4,638,284
4,638,285
34 4,638,286

CLASS 339

10 4,637,668
14 R 4,637,669
46 4,637,670
50 R 4,637,671
61 R 4,637,672
89 M 4,637,673
94 M 4,637,674
97 R 4,637,675
113 R 4,637,676
274 4,637,677

CLASS 340

22 4,638,287
52 F 4,638,288
52 H 4,638,289
56 4,638,290
59 4,638,291
63 4,638,292
4,638,293
4,638,294
73 4,638,295
83 4,638,296
304 4,638,297
310 A 4,638,299
347 CC 4,638,301
347 DA 4,638,302
4,638,303
347 DD 4,638,300
365 R 4,638,306
500 4,638,304
620 4,638,305
666 4,638,307
736 4,638,308
752 4,638,309
805 4,638,310
825.06 4,638,311
825.35 4,638,312
825.52 4,638,313
827 4,638,298
870.02 4,638,314

CLASS 342

5 4,638,315
14 4,638,316
373 4,638,317
383 4,638,318
417 4,638,319
442 4,638,320
444 4,638,321

CLASS 343

761 4,638,322
771 4,638,323
909 4,638,324

CLASS 346

1.1 4,638,325
75 4,638,326
4,638,327
4,638,328
76 PH 4,638,329
4,638,330
4,638,37[illegible]
4,638,332
4,638,333
108 4,638,334
135.1 4,638,335
140 R 4,638,336
4,638,337
4,638,338
153.1 4,638,339
204 4,638,340

CLASS 350

3.7 4,637,678
6.5 4,637,679
6.8 4,637,680
96.12 4,637,681
96.15 4,637,682
96.18 4,637,683
96.19 4,637,684
96.20 4,637,685
96.29 4,637,686
335 4,637,687
358 4,637,688
372 4,637,689
427 4,637,690
432 4,637,691
486 4,637,692
536 4,637,693
626 4,637,694
631 4,637,695

CLASS 351

41 4,637,696
161 4,637,697
163 4,637,698
205 4,637,699
211 4,637,700

CLASS 352

218 4,637,701

CLASS 354

173.11 4,637,702
276 4,637,703
286 4,637,704
403 4,637,705

CLASS 355

3 DD 4,637,706
4,637,708
3 R 4,637,707
4,637,709
72 4,637,710
4,637,711
75 4,637,712
76 4,637,713
77 4,637,714

CLASS 356

1 4,637,715
28.5 4,637,716
4,637,717
71 4,637,718
72 4,637,719
125 4,637,720
215 4,637,721
350 4,637,722
4,637,723
353 4,637,724
354 4,637,725
367 4,637,726
373 4,637,727
402 4,637,728
410 4,637,729
411 4,637,730

CLASS 357

15 4,638,341
4,638,342
17 4,638,343
22 4,638,344
24 4,638,345
25 4,638,346
54 4,638,347
74 4,638,348

CLASS 358

23 4,638,349
29 4,638,350
38 4,638,351
44 4,638,352
98 4,638,353
106 4,638,354
111 4,638,355
118 4,638,356
121 4,638,357
147 4,638,358
4,638,359
148 4,638,360
213 4,638,361
4,638,362
219 4,638,363
227 4,638,364
228 4,638,365
4,638,366
4,638,367
256 4,638,368
283 4,638,369
293 4,638,370
4,638,371
296 4,638,372
298 4,638,373
336 4,638,374
338 4,638,375
342 4,638,376
343 4,638,377

CLASS 360

15 4,638,378
18 4,638,388
19.1 4,638,379
22 4,638,380
51 4,638,381
68 4,638,382
72.1 4,638,389
74.1 4,638,390
77 4,638,383
4,638,384
96.4 4,638,385
96.5 4,638,386
122 4,638,387
125 4,638,391
130.32 4,638,392
132 4,638,393
137 4,638,394

CLASS 361

93 4,638,395
101 4,638,396
212 4,638,397
214 4,638,398
220 4,638,399
304 4,638,400
321 4,638,401
328 4,638,402
341 4,638,403
388 4,638,404
399 4,638,405
403 4,638,406
433 4,638,407

CLASS 362

61 4,638,408
104 4,638,409
105 4,638,410
145 4,638,411
156 4,638,412
242 4,638,413
370 4,638,414

CLASS 363

35 4,638,415
4,638,416
41 4,638,417
49 4,638,418
87 4,638,419
132 4,638,420

CLASS 364

167 4,638,421
200 4,638,422
4,638,423
4,638,424
4,638,425
4,638,426
4,638,427
4,638,428
4,638,429
4,638,431
4,638,432
300 4,638,430
400 4,638,433
401 4,638,434
405 4,638,435
414 4,638,436
427 4,638,437
446 4,638,439
449 4,638,438
475 4,638,440
483 4,638,441
489 4,638,442
497 4,638,443
510 4,638,444
513 4,638,445
518 4,638,456
555 4,638,446
556 4,638,447
565 4,638,448
715 4,638,450
760 4,638,449
900 4,638,451
4,638,452
4,638,453
4,638,454
4,638,455

CLASS 365

51 4,638,458
104 4,638,459
149 4,638,460
189 4,638,457
4,638,461
203 4,638,462
205 4,638,463
226 4,638,464
228 4,638,465
230 4,638,466

CLASS 366

64 4,637,731

CLASS 367

105 4,638,467
153 4,638,468
154 4,638,469

CLASS 368

109 4,637,732
120 4,637,733
294 4,637,734

CLASS 369

13 4,638,470
46 4,638,471
54 4,638,472

CLASS 370

27 4,638,473
60 4,638,474
4,638,475
83 4,638,476
94 4,638,477
4,638,478
95 4,638,479
112 4,638,480

CLASS 371

27 4,638,481
63 4,638,482

CLASS 372

26 4,638,483
42 4,638,484
4,638,485
107 4,638,486

CLASS 373

9 4,638,487
22 4,638,488
24 4,638,489
35 4,638,490
39 4,638,491
74 4,638,492

CLASS 374

8 4,637,735
45 4,637,736
141 4,637,737

CLASS 375

1 4,638,493
2.2 4,638,494
14 4,638,495
104 4,638,496
116 4,638,497

CLASS 376

216 4,637,910
217 4,637,911
245 4,637,912
247 4,637,913
353 4,637,914
435 4,637,915

CLASS 377

39 4,638,498

CLASS 378

7 4,638,499
109 4,638,500
182 4,638,501
207 4,638,502

CLASS 379

124 4,638,122
145 4,638,121
159 4,638,124
229 4,638,123
427 4,638,126

CLASS 381

16 4,638,503
4,638,504
24 4,638,505
34 4,638,506
68.4 4,638,125
94 4,638,507

CLASS 384

38 4,637,738
45 4,637,739
425 4,637,740
428 4,637,741

CLASS 400

121 4,637,742
124 4,637,743
185 4,637,744

CLASS 401

1 4,637,745
82 4,637,746

CLASS 403

23 4,637,747
170 4,637,748
322 4,637,749
344 4,637,750
379 4,637,751

CLASS 404

25 4,637,752
90 4,637,753

CLASS 405

150 4,637,754
181 4,637,755
184 4,637,756
227 4,637,757
248 4,637,758
270 4,637,759

CLASS 406

105 4,637,760

CLASS 408

16 4,637,761
203.5 4,637,762

CLASS 410

52 4,637,763

CLASS 411

5 4,637,764
41 4,637,765
180 4,637,766
411 4,637,767
452 4,637,768

CLASS 414

454 4,637,769
495 4,637,770
590 4,637,771
686 4,637,772
732 4,637,773
735 4,637,774
744 B 4,637,776
744 R 4,637,775
751 4,637,777

CLASS 415

53 R 4,637,778
143 4,637,779

CLASS 417

68 4,637,780
216 4,637,781
300 4,637,782
318 4,637,783
320 4,637,784

CLASS 418

48 4,637,785
55 4,637,786
203 4,637,787

CLASS 420

73 4,637,843

CLASS 422

36 4,637,916
46 4,637,917
89 B1 4,032,296
148 4,637,918
300 4,637,919

CLASS 423

67 4,637,920
315 4,637,921
321 R 4,637,922
328 4,637,923
345 4,637,924
447.4 4,637,925
573 R 4,637,926
644 4,637,927
659 4,637,928

CLASS 424

9 4,637,929
28 4,637,930
78 4,637,931
101 4,637,932
131 4,637,933

CLASS 425

4 R 4,637,788
89 4,637,789
208 4,637,790
425 4,637,791

CLASS 426

117 4,637,934
443 4,637,935
523 4,637,936
570 4,637,937

CLASS 427

53.1 4,637,938
162 4,637,939
176 4,637,940
297 4,637,952

CLASS 428

8 4,637,941
17 4,637,942
35 4,637,943
4,637,944
4,637,945
63 4,637,946
68 4,637,947
89 4,637,948
110 4,637,949
168 4,637,950
215 4,637,951
333 4,637,953
342 4,637,954
379 4,637,955
391 4,637,956
395 4,637,957
416 4,637,958
425.9 4,637,959
469 4,637,960
579 4,637,961
616 4,637,962
694 4,637,963
4,637,964

CLASS 429

1 4,637,965
57 4,637,966
101 4,637,967
105 4,637,968
111 4,637,969
153 4,637,970

CLASS 430

59 4,637,971
84 4,637,972
122 4,637,973
126 4,637,974
353 4,637,975
523 4,637,976

CLASS 431

1 4,637,792
202 4,637,793

CLASS 432

58 4,637,794
138 4,637,795

CLASS 433

7 4,637,796

CLASS 434

118 4,637,797
191 4,637,798
236 4,637,799

CLASS 435

11 4,637,978
15 4,637,977
19 4,637,979
68 4,637,980
75 4,637,981
129 4,637,982
240 4,637,983
4,637,984

CLASS 436

10 4,637,986
151 4,637,987
518 4,637,985
546 4,637,988

CLASS 440

55 4,637,800
67 4,637,801
75 4,637,802

CLASS 445

23 4,637,803
36 4,637,804

CLASS 446

71 4,637,805

CLASS 455

617 4,638,508

CLASS 464

130 4,637,806
135 4,637,807

CLASS 474

80 4,637,808
4,637,809
253 4,637,810

CLASS 493

167 4,637,811
357 4,637,812

CLASS 501

135 4,637,989

CLASS 502

10 4,637,990
68 4,637,991
84 4,637,992
242 4,637,993
404 4,637,994
439 4,637,995

CLASS 514

11 4,637,996
17 4,637,997
42 4,637,998
201 4,637,999
211 4,638,000
212 4,638,001
4,638,002
255 4,638,003
272 4,638,004
323 4,638,006
340 4,638,007
411 4,638,008
423 4,638,010
428 4,638,009
438 4,638,011
469 4,638,012
561 4,638,013
619 4,638,014

CLASS 521

85 4,638,015
129 4,638,016
157 4,638,017

CLASSIFICATION OF PATENTS

CLASS 522

103	4,638,018
104	4,638,019

CLASS 523

406	4,638,020
457	4,638,021

CLASS 524

15	4,638,022
21	4,638,023
22	4,638,024
40	4,638,025
98	4,638,026
157	4,638,027
292	Re.32,334
387	4,638,028
430	4,638,029
536	4,638,030
773	4,638,031

CLASS 525

54.11	4,638,032
67	4,638,033
369	4,638,034
384	4,638,035
462	4,638,036
471	4,638,037
533	4,638,038
534	4,638,039

CLASS 526

245	4,638,040
247	4,638,041
280	4,638,042

CLASS 528

75	4,638,043
125	4,638,044

CLASS 530

321	Re.32,333
323	4,638,045
332	4,638,046
	4,638,047
380	4,638,048
388	4,638,049
413	4,638,050

CLASS 534

14	4,638,051
575	4,638,052
589	4,638,053
637	4,638,054
678	4,638,055

CLASS 536

54	4,638,056
76	4,638,057
103	4,638,058
121	4,638,059

CLASS 540

203	4,638,060
355	4,638,061
	4,638,062

CLASS 544

2	4,638,063
54	4,638,064
196	4,638,065
336	4,638,005
344	4,638,066

CLASS 546

15	4,638,067
169	4,638,068
300	4,638,069

CLASS 549

23	4,638,070
88	4,638,071
234	4,638,072
556	4,638,073

CLASS 556

98	4,638,074

CLASS 558

5	4,638,075
277	4,638,076
281	4,638,077
414	4,638,078

CLASS 560

4	4,638,079
35	4,638,080
40	4,638,081
62	4,638,082
104	4,638,083
202	4,638,084
208	4,638,085

CLASS 562

401	4,638,086
467	4,638,087

CLASS 564

23	4,638,088
292	4,638,089
437	4,638,090
473	4,638,091

CLASS 568

1	4,638,092
73	4,638,093
309	4,638,094
326	4,638,095
433	4,638,096
617	4,638,097
630	4,638,098
638	4,638,099
645	4,638,100
720	4,638,101
724	4,638,102
827	4,638,103
	4,638,104

CLASS 585

481	4,638,105
640	4,638,106

CLASS 604

6	4,637,813
27	4,637,814
28	4,637,815
62	4,637,816
81	4,637,817
89	4,637,818
369	4,637,819

CLASSIFICATION OF DESIGNS

D1—	106	287,780
	115	287,781
D2—	309	287,782
		287,783
	320	287,784
	642	287,785
D3—	35	287,787
	39	287,788
	40	287,789
	106	287,786
D4—	104	287,790
	107	287,791
		287,792
D6—	303	287,793
	360	287,794
	436	287,795
	483	287,796
		287,797
	498	287,798
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